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Per. 457.

Per. 2705 f. $\frac{207}{2}$

第十一章 亂世之亂世：民變與社會動盪

1. *Geography* (100 marks) (100 marks)



THE
QUARTERLY VISITOR:

CONTAINING
ESSAYS;
MISCELLANEOUS PIECES,
IN PROSE AND VERSE;

Grammatical and Philosophical Queries;

REVIEWS OF BOOKS,

On Science and Education;

MATHEMATICAL PROBLEMS,

&c. &c.

SELECTED FROM THE
CONTRIBUTIONS OF MEN OF EMINENCE,
In most Parts of the Kingdom.

Conducted by W. PASSMAN

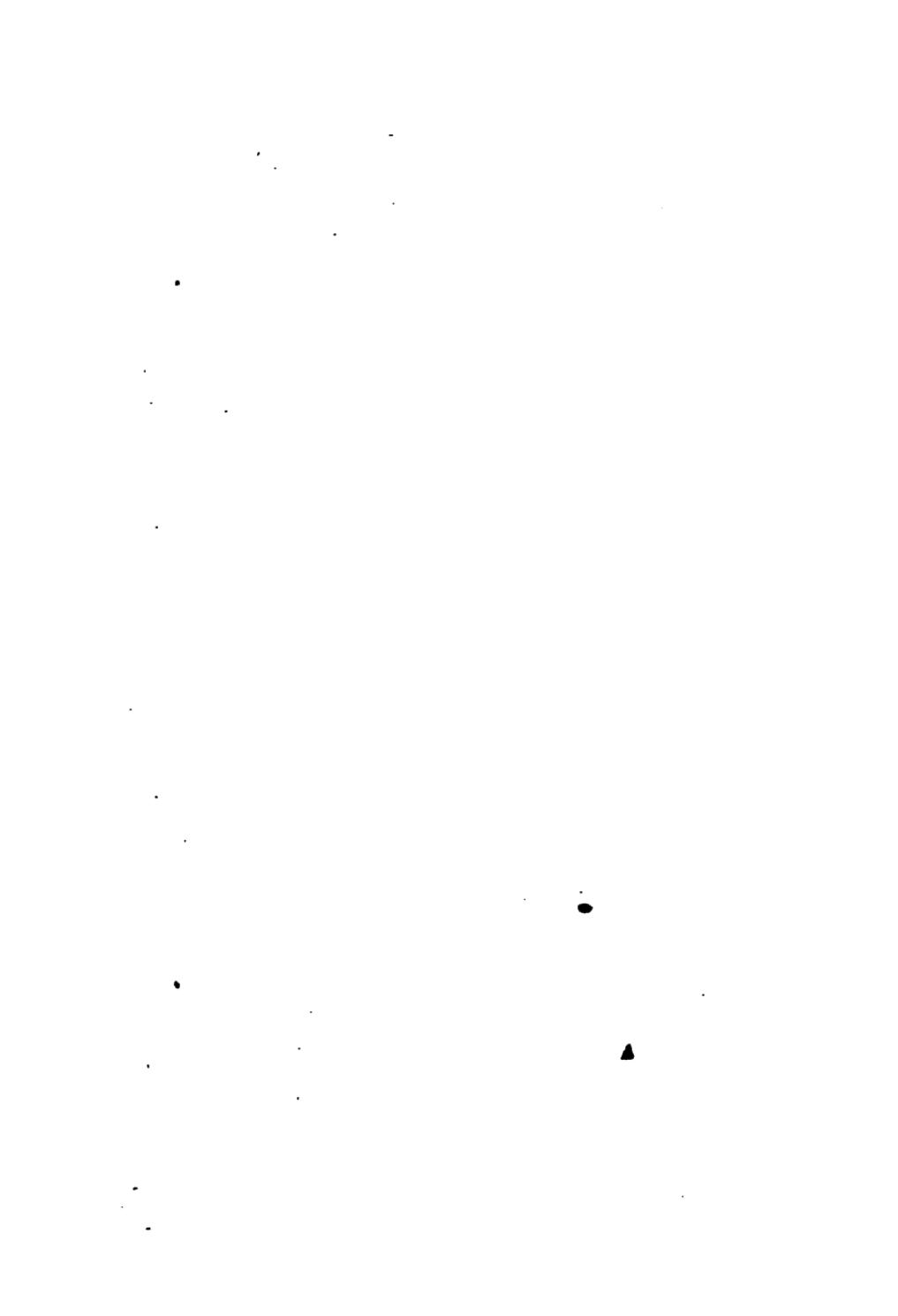
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THE
QUARTERLY VISITOR.

“DELECTANDO PARITERQUE MONENDO.”

HORACE.

No. I.

SEPTEMBER, 1814.

Vol. II.

To the Editor of the QUARTERLY VISITOR.

By the insertion of the *Fragment, addressed to the Fates*, (No. 6, p. 262) I have been induced to transmit you the following brief memorial of its author, extracted chiefly from the *Biographia Cumbriensis*, published in Hutchinson's History of Cumberland.

CLERICUS.

ISAAC RITSON, the son of Isaac and Elizabeth Ritson, of Emont-Bridge, near Penrith, was born in the year 1761. His parents were of that religious society called Quakers; but his father dying when he was young, and he being lame and infirm, his mother became desirous, and accordingly exerted herself, to give him such an education as should enable him to support himself in the world.—After having acquired the first rudiments of learning, he was put under the care of that excellent master, the Rev. Mr. Blain, curate of Greystock; and his progress was so uncommonly rapid, that at nine years of age he had made no ordinary proficiency in Greek.—Ritson was, indeed, uncommonly apt in every branch of learning in which he engaged; and his advances therein seemed more like the revival of what he had previously known, than the acquisition of new information.

From an anxiety in the mother for the preservation and purity of the religious principles of her son, he was removed, at thirteen years of age, to the Quaker-school, at Kendal, though much against his own inclination, for

Mr. Blain and Ritson were suited in genius ;—the master was a man of fine taste, and most passionately fond of the classics ; and a lesson under him, was more in the manner of a conference or conversation, than in the usual dry didactic way of schools.

From the moment Ritson understood Greek, the Father of Poetry was his constant companion ; and he read his battles with insatiable avidity.—After his return from Kendal, he studied mathematics under Mr. John Slee, a very intelligent Quaker, and an excellent mathematician, then resident at Mungrisdale, in the parish of Greystock : Ritson's ideas were so clear, that he understood the propositions in the first six books of Euclid almost as soon as he read them ; and had he confined himself to mathematical studies, he would, undoubtedly, have distinguished himself greatly.

At the early age of sixteen, he commenced schoolmaster at Carlisle ; where he conducted his school with great credit to himself and advantage to his pupils :—but after about two years of patient acquiescence in a course of life, in which his profits were by no means adequate to his labours, he set off, (though lame,) on a pedestrian excursion into Scotland, with an intention of visiting the Highlands ; and particularly St. Kilda, and the island of Staffa. This journey he must needs have performed literally in the stile and character of a bard ; for, though he entered on it, but indifferently provided, and with about twenty shillings only in his pocket, in about twelve months, he returned well apparell'd, and *with a pony*.—In this tour he picked up many beautiful heroic ballads and songs, which he used to sing with infinite glee,—a pleasing manner, and passionate expression, supplying the defects of voice and musical taste.

On his return, he again sat down to the dull business of *breathing dry rules into heedless ears*.—He taught school at Penrith about two years : but, though the powers of his mind, his lively fancy, and the vivacity of his temper, always secured him an admittance into good company, still he sighed for a situation of greater scope, to enjoy opportunities of obtaining more copious information.—He, therefore, a second time, relinquished the ill-requited office of a schoolmaster ; and, not much richer than before, set

out on a journey into Scotland, with the intention of studying medicine at Edinburgh.—Here he became particularly attached to the late Dr. Brown, who paid him much attention. There was, indeed, a great resemblance between their characters ; they were both of them men of genius and learning, but eccentric, and sometimes imprudent.—Ritson remained two years at this celebrated seat of medical learning, during which time he supported himself by writing *theses* for such of his fellow students as were either too indolent or too illiterate to write for themselves—On his return from Edinburgh, he went to London, professedly with a view of completing his medical education ; where, having no other resource, he supported himself by his literary exertions. He published a translation of Homer's Hymn to Venus, which was not ill received, though far inferior to his translation of *Hesiod's Theogony*, which, we fear, is irrecoverably lost—This last work was begun whilst Ritson was under Mr. Blain, and before he was twelve years of age ; and we believe it was the only work with which he ever took much pains, as he continued to correct it as long as he lived. In his other poetical effusions, there was an original wildness ; his mind was strongly tinctured with the sombre magnificence of his country ; so that his poetry, like Gray's, was sometimes overloaded with what Dr. Johnson calls a *cumbrous splendor*. This, however, is not so visible in his translations, which have all the ease of modern compositions.—He wrote with uncommon facility ; and his prose was vigorous and animated.

It seems to be the happy privilege of genius to know every thing, even matters of fact, as it were intuitively.—Like the Milk-woman of Bristol, Ritson knew, understood, and wrote well on various matters, of which there is no evidence that he had ever heard. He had written, and intended to have published, a set of essays on moral and philosophical subjects ; but these are also lost. He partly maintained himself in London, by taking private pupils ; and also earned something by writing, for a time, the medical articles in the *Monthly Review*. Dr. Johnson speaks of the London booksellers as the best patrons

of men of learning ; this may be the case with those who have already made their way to fame ; but, if we may judge from the cases of Chatterton and Ritson, booksellers are not more forward than the rest of mankind, to patronize that genius, which the world has not previously patronized.

Ritson, though lame, with the aid of his staff, was active and alert ; and he loved to wander among mountains and lakes, and there concieve and compose Poetry. In such situations, he touched every thing with the pencil of *Salvator Rosa*.—He was an admirer of Shakespear, and well acquainted with the dramatic writers of Greece and Rome ; and often talked of producing a dramatic piece on the Grecian model ;—but this, and many other projects, which were for ever employing his busy and fertile imagination, were all blasted by a premature death.—After a short, but irregular life in London, he died, after a few weeks' illness, at Islington, in 1789, and in the 27th year of his age.

MR. EDITOR,

SINCE I read the excellent review of Lloyd, on the Choice of a School, in your last number, I have occasionally turned my thoughts to the subject of education : having a son, for whom I have amassed an ample fortune, it is my ardent wish that his mental acquirements shall be adequate to his pecuniary possessions.

On this subject I wrote to a friend, who favoured me with the following observations, which, he says, are culled from a variety of reading. As I purpose to profit from his labours, I hope there will be no impropriety in requesting a place for his remarks in your useful Miscellany, that others may do likewise. Yours, respectfully,

Doncaster, July 9th, 1814.

PATER.

Whatever Xenophon, Locke, or even Lloyd may have advanced on the subject, the first thing which ought to occupy the mind, respecting education, should be its ultimate object—a consideration too often neglected.—Education includes the whole progress which forms the

human being in habits, principles, and every kind of cultivation. But of this even a very small part is in the power of the parent; and yet a still smaller can be acquired by purchased tuition of any kind. You may engage for your son competent masters and tutors, and you will do well; for they can, at least, give him the means of obtaining accomplishments and a knowledge of science; but, in the business of Education, they can do little for you. You may ask what will educate your son—your example will educate him; your conversation with your friends and acquaintance will educate him; the business he sees you transact; the *likings* and *dislikings* you express; these will educate him; the society in which you live will educate him; your domestics will educate him; above all, your rank and situation in life, your house, your table, your pleasure-ground, nay your hounds and your stables, will educate him: and it is not in your power to withdraw him from the continual influence of these things, except you withdraw yourself from them also.

You talk of *beginning* the education of your son. The moment he was able to form an idea his education began, the education of circumstances,—insensible education, which like insensible perspiration, has a more constant and powerful effect, and is of infinitely more consequence to the habit than that which is direct and apparent. This education goes on at every instant of time, it goes on like time: you can neither stop it nor turn its course. What these have a tendency to make your child, that he will be. Maxims and documents are good till they are tried, but no longer; they may teach him to converse, but nothing more. The circumstances under which your son is placed, will be more prevalent than your example; and you can have no right to expect him to become what you yourself are but by the same means. You have toiled during youth to set your son upon higher ground, and to enable him to begin where you left off. Do not expect that son to be what you were; diligent, modest, active, simple in his taste, and fertile in resources. You have put him under a very different master. Poverty educated you; opulence will educate him. How can you suppose the

result to be same? You must not expect that he will be what you now are; though relaxed from the severity of your frugal habits, you still derive advantages from having formed them; and, in reality, you like plain dinners, early hours, and old friends. But it will not be so with your son: his tastes will be formed from your present situation, not from your former one.

I wish not to be considered as inveighing against wealth, or against the enjoyments of it; I only wish to prevent unprofitable pains and inconsistent expectations.

From experience I have found that there is nothing which has so little share in education as direct precept.—To be convinced of this, you need only reflect, that there is no point we labour more to establish with children, than that of speaking truth; and there is not any in which we succeed worse. And why? because they know that in the common intercourse of life, a thousand falsehoods are told. But these are called necessary untruths on important occasions.

I do not mean to assert that didactic instruction has no influence; it has much: yet the sentiments we occasionally utter, the conversation overheard by children, when playing unnoticed by us, have a far greater effect on their infant minds than what is addressed to them in the way of exhortation. To form a just idea of the effect these admonitions have upon your son, reflect upon that which a discourse from the pulpit, considered by you as merely professional, has upon yourself. There is in most children a perspicacity to discern between the maxims you adduce for the regulation of their conduct, and those by which you direct your own.

“Respect nothing so much as virtue (says a father to his son); virtue and talents are the only basis of distinction.” The child soon has occasion to inquire why his father takes off his hat to some people and not to others; he is told that outward respect must be proportioned to different stations in society. This is somewhat difficult to comprehend; however, by a little dexterity in explanation, he is made to understand it tolerably.

You may send your son to a public school; and, to secure his morals against the vice which you apprehend abounds there, you engage for him a private tutor—a

sturdy moralist. He may help to prepare his tasks ; but can you imagine it will be in his power to form his mind ? No. His schoolfellows, the allowance you grant him, the manners of the age and the place will do that, and not the lectures which he is obliged to hear.

Education, it is often remarked, is an expensive thing. It is so ; but paying for lessons is the smallest part of the cost.—If you would be at the expense of having your son a worthy man, you must be so yourself ; your friends, your servants, and your company, must be all of that stamp : suppose this to be the case, much is done ; but there will remain circumstances which perhaps you cannot alter, that will still have their effect. The single circumstance of having a fortune to get, or a fortune to spend, will probably operate more strongly upon his mind, not only than your precepts, but even than your example.—You wish your son to be modest and unassuming ; you are perhaps so yourself, and you pay liberally for giving him lessons on humility. You are not aware that having a man of letters and accomplishments retained about his person, for his sole advantage, tends more forcibly to inspire him with an idea of self-consequence, than all the lessons he can give him to repress it.

From what is said, you will perceive *you* are the person who must educate your son. As education is necessary for all ; for the poor and the rich, for the illiterate and the learned ; Providence has not made it dependent upon systems uncertain, operose, and difficult of investigation. Every one has time to educate his child ; the poor man educates him while working near his cottage ; the man of business while employed in his counting-house.

But the education of your house, is only a part of a more comprehensive system. Providence takes your child, where you leave him. Providence continues his education upon a larger scale, and by a process which includes means far more efficacious. Should your son enter the world at eighteen, opinionated, haughty, rash, and inclined to dissipation : do not despair, he may yet be cured of these faults, if it please Heaven. There are remedies which you could not persuade yourself to use, if they were in your power, and which are specific in cases of this kind. How often do we see the presumptuous giddy youth changed.

into the wise counsellor, and the considerate steady friend! Humbled self-consequence, disappointed ambition, or the loss of fortune, is the bitter and effectual physic provided by Providence, to meliorate the temper, correct the offensive petulancies of youth, and bring out all the energies of a finished character. Afflictions soften the proud; difficulties stimulate the ingenious; successful industry gives consequence and credit, and develops a thousand good qualities. There is no malady of the mind so inveterate as not to admit of a cure by this education of events, if life were long enough.

To the Editor of the QUARTERLY VISITOR.

SIR,—The prompt attention with which you honoured my last communication, ought to have induced me sooner to fulfil my engagement, of sending the continuation of my narrative respecting *Amanda*; but, as it is probable the greater part of your readers may have forgotten what I formerly related of this fastidious fair one, I refer them to the third number of your work. My paper bears the signature *ÆSCULAPIA*. I concluded, Sir, with informing you that I had succeeded in my desire of obtaining the dismission of the juvenile M. D.; and the consequent promise of the resignation of the sentimental *Amanda* to my *entire* management.

I determined, therefore, to lose no time in removing her to my own house, convinced that this would be the most efficacious means of promoting her recovery. When the artificial wants and capricious fancies of such patients are studiously gratified, it frequently happens that this morbid indulgence is the fruitful parent of a spurious progeny; and, consequently, it is expedient merely to comply with such of their requests as are essential to their comfort.

Being convinced that it would have been in vain attempting to obtain the ready consent of *Amanda* to my scheme of a removal from her home, I calmly informed her that it was my intention to call for her the following day, at the *precise* hour of twelve; and that I expected she would be in readiness to accompany me; that her weak state of health required a change of *air* and *scene*; and my residence was quite adapted for the reception of invalids.—I

added, that I had accomplished my desire of prevailing with her mother to agree to my proposal, as I was in truth actuated by no motive, save the hopes of contributing to her happiness and welfare. I assured her that she should be in all respects treated with judgment and *scientific* skill, and would also be indulged with cheerful and profitable society.—Amanda looked suspicious and displeased; she affected to faint, which I affected not to observe; her known antipathy to smells, precluded any offer of *olfactory* aid; at length she gave an *hysteric* scream; I rang the bell; her mother and sister entered: she threw herself into the arms of the former, shrieked most violently, alternately laughed and wept, and vowed by “the powers above,” “she would never leave the protection of her beloved parent, for that of a stranger”—I confess I was somewhat amused by observing the variety of expedients devised in rotation by her attentive sister to appease the afflicted damsel—*Lavender drops!* *Hartshorn*, and other volatile spirits! *Wine!* *Brandy!* finally *Ether* and *Laudanum*!! Baneful injurious system! I would have almost deluged her with *water*, cold as “December snow,” could I have procured it.—Alas! alas! it is to such ruinous treatment that some women owe the origin of many destructive and pernicious habits, which eventually fail not to destroy their constitutions, and to engender “diseases dire;” but this is not all, such habits are in too many instances productive of practices at which morality shudders.—They tend to inebriety: an intoxicated female! who does not recoil with mingled pity and disgust from the contemplation of such an object!! Beware then, oh ye mothers! how you encourage in the objects of your affection the indiscriminate use of stimulants; they are, I allow, requisite in peculiar cases of protracted debility; and on some occasions may be resorted to when other expedients have failed; but a scientific physician *very seldom prescribes* them—at least, not if he have benevolence sufficient to act a disinterested part.

Pardon Sir, this digression.—The mother of Amanda most assiduously guarded the nostrils of her fastidious child from the admission of perfumes which might in any degree annoy or further discompose her.—But not even the united efforts of these injudicious attendants could

effect her relief. Her bosom, at first, gently heaved with an imaginary sense of suffocation ; then, "ever and anon," it swelled with convulsive agonies, which the pungent stimulants so plenteously administered tended to augment ; and so earnestly and so piteously did she intreat to see Dr. ——, her juvenile friend, that, to my inexpressible chagrin, he was once more admitted to the house. I was determined *not* to retire while he remained, being anxious to observe the movements of this *Æsculapian hero*. Never shall I forget his *insinuating* smile, and soft address, nor yet the *elegant style* in which he felt the pulse of his fair patient. No sooner had he administered an *anodyne draught*, than Amanda exclaimed, "I am better now;" truly, the salutary effect was instantaneous.—"My dear Dr. ——, you are so very skilful, you so well understand *my case* ;" she then seized his hand, and pressed it to her lips.—He turned towards me; (doubtless he was ignorant that I was the identical "*female quack*" of whom he had heard, and against whom he had vented so much acrimony) "Madam," said he, "this is a most singular case; Miss E. has a very peculiar pulse; so *variable* ! her nerves are so *exquisitely tremulous*; she requires minute and delicate attention; quietude is absolutely necessary in her present state of extreme weakness; or really, according to my opinion, she will never recover. I would have her kept *perfectly composed*; on no account to be contradicted, or to see any person of whom she does not approve. I will write a prescription, that which I have recently given her was merely a little laudanum and ether; but I will carefully study her case, and that *immediately*, and hope to see her again this evening." I only courtesied; feeling assured that if I ventured to speak, I should offend, and betray myself to this my *medical opponent*.

After his departure, I withdrew from the apartment of *Amanda* to seek that of *Mrs. E.* I gently knocked at the door, and was desired to enter: she was weeping bitterly! My dear Madam, said I, be not thus distressed, your daughter is not in the least danger, I should be sorry to deceive you. Pray let me intreat you to exert your fortitude, be firm, and fulfil the promise you have given me of committing her to my care; she would, I doubt not, be perfectly recovered in the space of one month. I will

engage to treat her as a child of my own—not assuredly by humouring her whims, not by encouraging the diseases of the imagination; but by a steady perseverance in my own plans, which I, by experience, ("the test of truth") know to be the most efficacious.—Consider, dearest Madam, what would become of Amanda in the event of your decease: your pension lost, and but a very slender pittance remaining for the mutual subsistence of your daughters. If her affectation be further indulged she will become burthensome to herself, and useless to society.—Not that I contend against your method of treatment merely on the ground of her poverty; for if she was *my* daughter, and heiress to thousands, I would not suffer such ridiculous conduct; but, you must admit, that the world *in general tolerates that folly in a woman of fortune* which is greatly censured in the *child of poverty*.

Pardon me, dearest Madam; on no account would I hurt your parental feelings; no, I respect the tears of the widow, more especially do I respect those of such widows as have lost the objects of their tender love by *war's dread scourge*; but *you* most certainly deceive yourself: you erroneously mistake *undue indulgence* for *affection*.—Now, they who consult the welfare of those, for whom they profess to entertain regard, best evince the reality of their affection.—I confidently appeal to any person of *judgment* to determine whether *you* are acting the part of a prudent mother. Deem me not harsh, the time will yet arrive, my dear Mrs. E. when you will, I hope, acknowledge the wisdom of the advice I now offer; at present your eyes are beclouded by the mists of prejudice. I trust, however, that Amanda will be reclaimed; and, at some future period, become the happy wife of a man of sense and virtue, who will, by *faithful and salutary counsel*, invigorate the powers of her mind, and thus overcome her follies. At present, no man of common understanding, could be mad enough to call her wife.—I beg leave, Madam, replied Mrs. E. somewhat piqued, to dissent from your opinion: my daughter has *beauty*, and personal attractions; and in the person of Dr. —, she has a most faithful lover.—No, no, my good friend, said I, you are in this conjecture quite mistaken: Dr. — has not, I'll venture to declare, the smallest intention to marry Amanda.

—Medical men, of small independent fortunes, consider either *money* or *prudence* essential to their matrimonial comfort. They too often prefer the *former*: but not unfrequently are satisfied with the latter. This difference of sentiment depends on the individual bias of their inclination, and the *refinement* of their minds; but certainly the judicious amongst them never choose such women as are the victims of affectation, because they can readily distinguish between disease, and its counterfeit.

(*To be continued in No. VIII.*)

ON FAME.

“ The love of praise is planted to protect
And propagate the glories of the mind.
What is it, but the love of praise inspires,
Matures, refines, embellishes, exalts.” YOUNG.

THE mischievous effects produced by the love of *fame*, have brought it under the censure of every religious and moral observer of men and things; while the good it sometimes produces is generally overlooked. That it is the cause of great part of those convulsions which so frequently shake the globe, laying whole empires in ruin, and slaugh-
tering thousands of harmless individuals, is a fact which none will deny. That it is also productive of good effects, will appear equally obvious if we give it a serious and candid examination.

Fordyce, in one of his “ Addresses to Young Men,” says, “ among civilized and enlightened people the passion for glory has operated in an extensive sphere, and given birth to very beneficial effects. That it has often been the occasion of much mischief, we pretend not to deny: but can you name any passion, or any principle, which, how-ever good, or however dignified in itself, is not, when perverted, liable to the same objection?”

That the good of which this passion is productive, will counterbalance its evil effects, I do not presume to determine; but will endeavour to show how it may, with propriety, be said to benefit society.

Dr. Young says,

“ The *love of fame*, how’er concealed by art,
Reigns more or less, and glows in *ev’ry heart*.”

And Pope, that

“ Millions of suppliant crowds *fame’s* shrine attend,
And *all degrees* before the goddess bend;
Their pleas are diff’rent, their request the same,
For *good* and *bad* alike are fond of *fame*.”

If so, and the only way of securing the admiration and applause of posterity be by rendering some essential services to our fellow-creatures, (and this I think needs no demonstration,) I hope I shall not be deemed presumptuous in ascribing to this, many of the benefits we receive from each other. To this we are indebted for some of the most valuable discoveries in science; for the toil attending those discoveries being great, and the pecuniary advantages small, it would be so discouraging, (were it not for this,) as to prevent them ever being brought to perfection. But, actuated by this principle, men resolutely combat every difficulty that may oppose them in their pursuits.—Some have all their lives toiled in one particular department of science, for which they have neglected the calls of interest, the allurements of pleasure, and even the common comforts and necessities of life; and, with an ardour which it was not in the power of sober reason to suppress, have pursued *fame* as the only object worthy their attention,

“ Toil on, dull crowd,” in extacies each cries;
“ For wealth and title, perishable prize;
While I those transitory blessings scorn,
Secure of *praise* from ages yet unborn.”

What has induced so many men of rank, blessed with honour and affluence, brought up in luxury and ease, and unaccustomed to the hardships of a naval life?—what is it, I say, which has induced such to relinquish all their enjoyments; to leave their friends, their families, their native country, and every thing they esteem dear, and to

expose themselves to all the fatigue and dangers of a long voyage? Is it their sole desire to make useful discoveries, and benefit mankind by their toils? No!—I am persuaded

“ *Self-love, the spring of action, moves the soul.*”

And hence I infer, that fame is the principal object of their pursuit. Now that those discoveries are of benefit to society, none will be so unreasonable as to deny; and yet the motives which prompt men to make them are frequently neither more nor less than have already been mentioned.

Numbers of instances, both ancient and modern, might, if required, be adduced, to show how much science is indebted to this principle. I shall, however, only notice two; namely *Cicero* and *Linnæus*, who, if we may credit history, were passionately enamoured of *praise*, and it is highly probable they are both indebted to this invigorating principle for that great eminence which they have attained in the literary world.

Of *Cicero*, Mr. Swinburn asserts, that “ If we take an impartial survey of his conduct and principles, avowed in his own epistolary correspondence, and trace him through all the labyrinths of his contradictory letters, we shall find more to blame than to admire; and discover that the desire of advancing his fortunes, and making himself a name, were, from his outset in life, the only object he had in view.” And Dr. Blair, after speaking of his excellence as an orator, has these words:—“ In most of his orations there is too much art, even carried to a degree of ostentation. He seems often desirous of obtaining admiration, rather than of operating conviction.” And again, “ Though the services which he had performed to his country were very considerable, yet he is too much his own panegyrist. Ancient manners, which imposed few restraints on the side of decorum, may in some degree excuse, but cannot entirely justify his vanity.”

The vanity of *Linnæus* is also said to have been so great, and his love of *praise* so unbounded, that he has been frequently exposed to the censure, and sometimes even to the ridicule of his friends.

With so ardent a passion for celebrity, we cannot for a moment suppose they would indulge in indolence or

indifference. No!—they would rather (animated by the hope of enjoying a future existence in the memory of posterity,) exert every faculty of their minds to its utmost stretch, “to advance the happiness of society, and to adorn humanity.”

In a nation like England, where christianity flourishes under the auspices of the government, and where deism and infidelity are almost universally disapproved, it is not difficult to discover the effects this principle has upon authors. It prevents many sophistical, immoral, and irreligious works being ushered into the world to warp the unwary from the paths of rectitude and religion, and to entangle them in the mazes of scepticism and infidelity. And, on the other hand, induces some, though immoral and irreligious, to recommend to others, that religion, which, in fact, they themselves reject.

To what do we owe many of those public charities with which England abounds, but to the before-mentioned principle. For even some of the most avaricious of mankind, that their names may be recorded in the “gilded rent-roll” of some hospital or asylum, and handed down to posterity as men eminent for their benevolence, will apply a part of their possessions to charitable purposes.

On the sons of Esculapius it has so operated as to produce the most salutary effects. For though there exists a set of unprincipled wretches, “who,” to use the words of the classical Knox, “boldly enter on the practice of this art (*physic*) totally destitute of preparatory instruction, and make a merit of their defect; who, without even those few lights which may be occasionally obtained in the course of a servile apprenticeship, assume all the importance of sufficiency, and dictate with an oracular confidence; who scatter pain and death around, under pretence of affording relief; and, for the sake of supporting an unbecoming parade in life, not only delude, but destroy those who apply to them as to friends, under the pressure of the heaviest calamities:” yet were it not for that principle, deeply rooted in the human breast, the *love of popularity*, such characters would abound more than at present they do.

Its effects in the *pulpit*, and at the *bar*, have been no less beneficial. In short, it has on every order of society, in a greater or a less degree, proved a powerful incentive to benevolence and philanthropy; and this, were it necessary, might be shown more at large: but as it would perhaps only prove tedious and uninteresting, I shall dismiss the subject.

Bridlington-Quay.

C*****.

To the Editor of the QUARTERLY VISITOR.

SIR,—Until I had read the 222d page, No. V. of your improving and entertaining Miscellany, I had been foolish enough to think that to visit the sins of the father upon the children was the *province of him only who made both*. Your friend Lex has, however, it seems, thought differently; because a foolish thing happened once at Market-Weighton, the people of that town, (though somewhat distant the time,) are now to be upbraided with it: Where Lex lives, or how his Grandmother first made tea, I know not; but if like other folks at that time of day, she was foolish enough to boil it by the pound together, to strain off the water and eat only the leaves buttered as we eat cabbage, nobody, I imagine, from such a circumstance, is so weak as to infer that Lex's intellects have suffered by it.

Whether that feeling of the mind, commonly known by the name of prejudice or partiality, is, or is not an innate principle, I leave to Locke and those who differ from him to determine. Certain, however, it is that, generally, we have so much of either one or the other of these about us, that, even with the strongest light, we can seldom induce ourselves to see things as they really are; Lex must, therefore, feel pity rather than displeasure, if, in reviewing the subject of paper and metallic currency, I should dissent from him. Had this gentleman been fortunate enough to have favoured the world with his thoughts on the above subject, about eighteen years ago, he would have met with many whose minds would have been in unison with his own; for I am told about the year 1796, and even prior to that period, a pound note and a shilling would, on demand, have obtained a *real guinea*. In fact, so nicely

were these two media of circulation balanced, that if the guinea had suffered the least loss, either by friction or clipping, that loss was always deducted before an exchange took place, as every body kept scales. The advantage then was with paper: its value was stamped on it—no deductions were required. So long as a person could obtain a guinea for a pound note and a shilling, it was of little consequence what was the value of the former. If a guinea would buy more to-day than it would to-morrow, the holder of paper knew that his notes would do the same thing. Whilst matters remained in this state, most people, except *hoarders*, were indifferent whether they took paper or gold—on account of its portableness, the former was often preferred. In short, the indifference, on this point, was carried so far, that at length a pamphlet appeared, entitled *GUINEAS AN ENCUMBRANCE*.

In this, as in Lex's paper, many arguments were used to prove the advantages of paper over gold. Whether this author's reasoning—the general opinion, or “Necker's Imperious Necessity,” led the Bank of England directors to think that guineas were really an encumbrance is not exactly known; at least one does not wish to be so ill-natured as to say. However, the folks in Threadneedle-street took it into their heads to try the experiment.—From this time, but I may be wrong, I suppose that paper money began to depreciate: paper became one thing and gold another. So soon as cash, I mean golden payments were suspended, first by an Order in Council, and then by an Act of Parliament, in 1797, so soon did all cheques on paper money-making (except a man or company's own prudence, which is not always proof against temptation,) cease. Those hands which before had been tied not to issue more paper than they could demand specie for, particularly those of the Bank of England, were now let loose: that bank became identified with Government, and its paper was made a legal tender—a measure which at once completely removed every apprehension of that shop having again a run on it.

After this time, and even at present, all you can obtain of them for one of their pieces of paper, is another so like

it in feel, make, shape, &c. &c. that one might swear they were twin-brothers.

If, for a moment only, we consider the immense sums of money wanted, from time to time, particularly within the last twenty years, by a Government not at all parsimonious, and which that Government has actually received, the greatest part of which, from its very nature, has been confined to this country.—Is it, I say, at all to be wondered at, even admitting the increased demand for trade, that the circulating medium, the paper money of these kingdoms, should have been overcharged, and that this overcharge, having no other channel into which it could run, has, like the plenteousness of any other commodity, made it cheap, or in other words depreciated it.

In No. III. page 120, of the Q. V. it is said “That the value of the pound note was originally fixed at twenty shillings, and not more could ever be obtained for it; and twenty may be got for it to this day.” This information, I fancy, is furnished *en passant*, as the French say. Lex, I hope, does not mean to affirm that the Bank of England, or any other Bank, will give him twenty old mint-coined shillings for even one of their own pound notes. If, however, he has found out that they will do this, and to any amount, to argue then that paper money is depreciated would be only a waste of time. Lex might, perhaps, of a friend get 20 local, or plain Birmingham shillings for his paper, the intrinsic value of which shillings, in real silver, would not, probably, be more than $\frac{1}{2}$ or $\frac{2}{3}$ of what might, twenty years ago, have been obtained for the pound note; but if Lex will accept of these as the full value of his note —one may safely say, that that note is depreciated.

When a man has engaged to weigh one article against another, would it be fair to put into either scale a second, and distinct article, and then say, with the help of this I shall be able to cast the beam?—Certainly not. But allow me to say I mistake much, or Lex has done so—see page 158, Q. V. He says there “so long as 105 Bank notes will discharge a debt of 100 guineas, any argument on the depreciation of our paper currency, in support of a public measure, will be as “baseless as the fabric of a vision.” “In support of a public measure?” let me now ask the gentleman what he means: he surely does not—cannot

intend that this second article, which he puts into the scale with Bank notes, is to be the law of the land. Does he really mean to say that if the legislature insist that 105 notes, whether of any, or of no value, shall pay a debt of 100 guineas, it must be so? Money either is, or ought to be a something of intrinsic worth; and if so, it needs no assistance either from Government, or any body. It would seem, however, from Lex's connecting the system he advocates with the legislature, that all is not right with it; or, in other words, that it needs propping—aye and bolstering too.

A positive law may make a shilling a legal tender for a guinea, because it may direct the courts of justice to discharge the debtor who has made that tender; but no positive law can oblige a person who sells goods, and who is at liberty to sell, or not to sell, as he pleases, to accept of a shilling, as equivalent to a guinea, in the price of them. If, however, such a law was made in England, (here let me hint, that the suspending of cash payments was something like it,) and John Bull felt himself disposed to conform to the letter of it, much as he loves his country, I should be very much surprised if he did not advance his merchandise to twenty times what it was before such a law was made. If the rise (in many instances double) of almost every article in this country has not arisen from the cheapness of money and taxation, I should be glad to know what has been the cause of this advance. A paper, on this subject, would be thankfully received by many of your readers.

Whilst the present order of things continues, and whilst there is in the people a disposition, which I hope may long continue, to support Government; and whilst that power can make button-tops pass for value, perhaps it is difficult to say exactly how much, in this country, the pound-note has depreciated. As, however, "paper money and paper currency" both convey the idea of value, let us, by way of experiment, send a million or two of this sort of stuff to the continent, requesting the good folks there would send us in return any sort of produce, except "Assignats," what they consider its value: and if the return be to the amount of its nominal worth here—then, indeed, so long as Government exists, will it be all a farce about our paper money having depreciated.

Admitting that the Bank of England and all other Banks have property enough to make good every one of their promises—where, in case of alarm, (and such a thing, on a sudden, there might be, for even France, with all her late boasted-of armies, is now in the hands of foreign powers,) would the people run with their pound notes and guinea bills to obtain bread, whilst the bankers were putting their estates into such a shape, as that they could be divided amongst those who held their paper? It is really to be feared that some thousands would perish whilst this was doing. Evils of this sort have already, in some parts of this country, been felt from the failure of paper money-makers. Admitting, however, this difficulty ever attendant on a system solely of paper was got over—to suppose that the mischief would end here, is but taking a narrow—a confined view of the subject. Be it remembered that there is in this country a class of persons, which, besides having its share of Bank notes, holds paper money securities to a vast amount. This class consists of people commonly called stock-holders. To express the extent of their claims when the whole are put together—one has, without joking, to learn afresh one's numeration table.—Don't be startled, when I remind you, that these people hold securities for money actually lent, either at one time or another, to Government, to the amount of 840 millions of pounds sterling. Now, where I ask, in case of alarm, are the people to look for the value of the promises made to them? The money has been borrowed—and spent—the debt is just; but where is the source of payment—where is the mortgage deed?

How this country could have borrowed so much money, in so short a time, would puzzle any man to tell. The debt only began in 1692, and it took 105 years, even partially assisted by paper, that is up to 1797, to make it 500 millions; since which time, that is since all cheques on the Bank of England ceased, it has increased 340 millions in seventeen years: and where and when it will end, for it has been long promised that it should end, to man is not known. In giving this short statement of figures, I may probably not have been correct as to a few pounds; but the sum altogether of which I have been speaking is so large, that even a million or two will make but little difference.

Lex seems much pleased with the idea that from the stamp duty on paper money, the state is reaping a great advantage; but may I be allowed to inform Lex, that this, and all other benefits derivable from paper, as paper only, are but as a drop to the ocean, when contrasted with the mischief this system has produced, is producing, and which, without great wisdom, will produce either upon us or ours. To enumerate all the evils already felt from it would be lengthening this paper too much (indeed I have to apologize to you as it is); suffice it then here to say, that altho' this country, with the blessing of God, has produced us plenty of the necessaries of life, particularly bread, these necessaries cannot be afforded cheap, lest from the failure of those revenues absolutely required, not to pay off, but to pay only the interest of the 840 millions, of which we have been speaking, the country should be ruined.

Seeing that great and sudden changes take place in the affairs of nations, as well as of individuals, I would ask, ought that system of circulation, or currency, in which all are so vitally interested, to be termed an advantageous one, which, by a single breath, or even the shadow of an alarm, may be totally destroyed in a moment—turning with it thousands and tens of thousands on the world pennyless.

Better had it been that as a nation we had been content to have jogged on in the old fashioned way, that is, to pay with intrinsic value in our pockets, as to be what we now call ourselves—rich upon such an uncertainty. If our improvements had been fewer, and our incomes nominally smaller, our expenses would really have been so too—a most material point. What we had got we might, without the fear of its flying away, have left to our children.—As no change probably, except that which will destroy all things, will ever again materially affect the value of gold—what a breath has done before, it may do again, that is destroy paper.

Yours,

A NEW SUBSCRIBER.

Barton-on-Humber, 13th April, 1814.

SIR,

By a notice on the cover of No. VI. I understand that from "*A New Subscriber*," and "*Justitia*," you have received observations on my paper-system; and the conditions on which you have promised to insert them present a threatening aspect. In times like the present, when the effects of war, like those of a storm, are visible in the lessening wave; and the memory so cheered with martial exploits as to exclude almost every other subject, it is natural to form our ideas of the odds by the numerical force of the parties at variance; but if we take a right view of the subject, we shall be able to see that manual warfare differs materially from a polemic contest. In the former, by a superiority of numbers, the enemy may be outflanked, a party may *debouche* in his rear; whilst in the latter, guided by truth, a man may defend his sentiments successfully against a host of writers, whatever abilities they may possess, if they have not thought sufficient to enable them to form a right judgment on the case in dispute.

Under the influence of these reflections, I enter on a reply to *Amicus and Co.* free from apprehensions either for the safety of myself, or the system I have undertaken to defend. On a general view of the Weighton letter, it is manifest that its author has been more anxious to prove that I am depreciated than that paper currency is lowered in value; consequently, I shall have little more to do than to correct mistakements or misrepresentations with which it abounds; and as *Amicus* was in possession of the means of being correct, his claim on my candour is very small. He informs you, (pa. 252,) that he and his friends are inclined to think that I do not understand my subject; nobody will doubt that they are so inclined. The most prominent features in the next article are the words "*opposes*" and "*beaten* from their ground." The first shews that they have mistaken the defendant for the plaintiff in this case; and the second reminds me of a character of puppetshow—notoriety—who made others run, by running himself, that they might run after him.

I suspect that the sentence which begins with the words "*when a man shuffles and shifts, &c.*" originated with Mr.

Simpson, in a controversy with the Editor of the Ladies' Diary. Had I borrowed my "witty sayings," (as he has repeatedly termed them,) I might have returned his significant sneers with a blush. I have no knowledge of the people of Market-Weighton, but what I have learned from *Mrs. Shipley* and *Amicus*. From what the former said, I understood that they could not discriminate between a duet and a solo; and, from what the latter has written, (pa. 156) it appears that they decided on the question of paper currency under the influence of a speech, delivered by a scientific schoolmaster, in terms which were not generally understood. It was in consequence of the impression which the above information made, and not because the people of Weighton were good-natured, that I drew my very modest conclusion. The distinction between a determination to purchase books, and having them in possession, was so easy as to warrant the supposition that they had not any other book in the society, at the time alluded to.

Amicus has manifested as great a partiality for the words "militate against his own arguments," as he has for "witty sayings," having repeated them, (in nearly the same order,) an equal number of times. As I had not any design either to puzzle the lawyers, or himself, I will endeavour to define the similarity between notes and the title-deeds of estates: the former are proofs that the money or value has been received; the latter, (as he very properly observes) are proofs that the money has been paid. The former are bits of paper; the latter are bits of parchment. With the one you may pay for estates, and obtain the title-deeds; with the other you may obtain notes from the bankers, (pa. 221.) I have said and now repeat it, that the question is not whether a golden guinea or a note is the more valuable. That I ever asserted that paper is better than gold, and afterwards allowed that gold is better than paper, in the sense he has conveyed it, I deny in the most unqualified terms. To be convinced of this, and also of his error of taking credit to himself and others of the little society, for having compelled me to acknowledge that a guinea is better than a note, he may turn to page 120, and read as follows—"when the latter first appeared, their relative difference, in height, was as

twenty to twenty-one; since that time, the ratio has increased as twenty to twenty-eight." Three months after, (pa. 157) the old farmer makes the difference three shillings less. Since then, not more than ten months having elapsed, their ratio is as 20 to 22½; and their value may soon be at *par*.

It is true I have attempted to shew the advantages of a paper over a metallic currency; and those advantages will still continue, whatever the price of bullion may be, as must appear evident to every one who is capable of distinguishing between a circulating medium, and the value of the things of which this circulating medium is composed.

"If, from this day, notes should cease to be issued," it is probable we should have a gold currency, and the demand for bullion, in the market, would be such, as to cause a temporary rise in that article of merchandize; consequently such guineas as are yet unsold would obtain a higher price. I am already persuaded that the notes now in circulation, like all others that have been before them, will pass away,

"And leave some other of their race,

To seize their wealth, and take their place."

And so long as the drawers continue to take them up with Bank, or other Bankers' notes, and credit those who return them in payment, at 2½ shillings each, that will continue to be their value.

If the people collectively were persuaded that notes would never be taken up with guineas, it is probable that a majority would join their clamour with Amicus and Co. and raise their voices so high against paper currency, that the description Milton gives of the *Babel-builders* would apply to them:

Forthwith a hideous gabble rises loud

Among the builders; each to other calls

Not understood, 'till hoarse, and all in rage,

As mock't they storm;

Thus was the building left.

But as individuals, their unwillingness to part with them, at less value than they had received them, would operate so as to cause private interest to prevail over public clamour.

To make gold—fluctuating gold—the standard of payments, would draw with it a train of absurdities, not less ridiculous than if a serjeant should go into the country to recruit for the army, and take a *thermometer* for his standard. On his return, the commanding officer would ask by what he had measured the men, seeing some of them as tall as giants, and others mere pygmies—“An’t please your honour, I—I—measured them by this here thing; because I was told by every body that it was uscd all over the world.”

It is time we should cease to kick each other’s shins by the side of the hedge, whilst the ball lies in the field unmolested.

LEX.

REFLECTIONS ON IMMODERATE DRINKING.

The common opinion, that the faculties are enlivened by drinking a small quantity extraordinary, is ill founded; for a man, who requires strong drink to exhilarate him, is either ill-natured, or has not a proper degree of spirit: in either case a little reasoning would do better than the extraordinary glass, without running this hazard—that by going a step or two farther, all is wrong again; the sullen man becomes quarrelsome, and the bashful man noisy.

In Italy, where men are allowed to have the quickest and most subtle wit among the Europeans, the bottle is never called in to make them shine. Sherbets and small liquors are drunk at their assemblies—only because the climate requires them:—a man heated with liquor there would be thought fitter for his bed, than for conversation; indeed so he is every where, for many reasons. Wit is only commendable when well applied;—a sprightly saying, on a proper occasion, pleases men of sense; but a string of jests is only fit for a buffoon.

If it should be agreed that wit might be raised by wine, and that our climate warrants strong liquors, as that of Italy does cool ones; yet it is a dangerous experiment, unless we had a machine for drinking, a kind of barometer, that would shew all the degrees between exhilaration and madness; and this regulator must be fitted to every man’s

constitution, and every man must be supposed to have reason enough left, (when he has parted from his reason) to stop at a certain glass, in spite of ten thousand intreaties to drink another.—Every man who allows himself time to think, would be as fearful of trying the strength of his understanding this way, as of advancing to the edge of a precipice to try whether the strength of his brain would bring him back.

There are some, perhaps, who will pretend that drinking may be allowed to strong constitutions ; and, I am sorry to say, that, in all ages, there have been people silly enough to value themselves upon this strange qualification.—It was reported by the Athenian ambassadors to the people, with great signs of admiration, that King Philip of Macedonia could drink more than any of his subjects. Demosthenes, who was not one of Philip's admirers, answered, it was no great compliment paid to a Prince, to compare him to a sponge. His remark will be everlastingly true—an enormous swallower of liquor is no more than a human sponge.

It may indeed be allowed that many, who have had an indisputable title to wit and parts, have drunk immoderately, and, generally speaking, have drunk them away; but if men of wit do wrong, does it follow that to have the reputation of wit, we must imitate them?—or, if one may be allowed to play on the word, ought we to affect wit at the expense of our wits?

The two great blessings of mankind are serenity of mind and health of body; both of which are best preserved by strict sobriety. It is true, a man must be at some pains to find out proper subjects for the employment of his thoughts, when he is sober; but this is the business of a reasonable creature: whereas laughing, swallowing, and talking idly, are employments below human nature, and, as far as the comparison will admit, below even a brute.

It is annexed to human nature to have a portion of care, and he who endeavours to avoid that assigned him by nature, wilfully takes a larger. Intemperance is also the source of most diseases, which arise either from our excesses, or from those of our ancestors.

As a proneness to drinking leads a man into a variety of evils, which he had never thought on, so an inflexible sobriety engages a man in good habits which he could

never otherwise have acquired.—A sober man must do something consistent with reason; he, therefore, casts about for something that may please him also: this leads to the study of some science, or to the general study of all science, according to the natural bent of his genius.—In the pursuit of such views, he finds a sprightliness in his mind, warmer and better founded than any derived from strong drink, and unattended with any flagging of the spirits: he goes to rest tranquilly, leaving nothing with which to reproach himself: he rises cheerfully, because he has new, innocent, and worthy schemes to accomplish.—Whereas, he who drinks, falls asleep without knowing it; is uneasy when he awakes; and, vexed at being mad yesterday, makes himself mad to-day, that he may forget it.—In this manner the drunkard shortens the period of his natural existence; and, by so doing, commits a crime of no smaller magnitude than suicide.

Pythagoras being asked how a man addicted to drunkenness might be cured,—answered, by considering what ills drunkenness brings on him. This may be equally applied to those who drink wine, as to those who drink beer: the power of thinking is decayed as much by the former as by the latter; and the constitution rather more hurt by a foreign poison, than by a domestic one. Moreover, urging pleasure produces pain. A man drinks a glass at his meal with a proper relish; and, in this sense, “wine” may be said to “gladden the heart of man;” carried further the blessing is lost, and we spoil our taste, both for the present and the future. If once excess introduce disease, we must bid adieu not only to the pleasure which produced it, but to all pleasure whatsoever.

Guisbrough, July 14th, 1814.

J. Y.

We are requested to insert the following, it being an existent circumstance.

To the VISITOR,

O cursa hominum! O quantum est in rebus inane!—PERS.

CUPIDUS in early life married, and obtained, as his wife's portion, a sum under 1000L. By parsimonious saving, for

nearly 60 years, he has amassed four times that sum, and an annual income of about 250*l.* His good DEPARCA and he live a short distance from town; and, as keeping a servant would be an insupportable expense, he kindly assists in *all* domestic offices. His pipe, and the thoughts of his store, keep his mind in perpetual agitation; and lest he should become poor, his charity is extended only around his fire side. Having no relatives to enjoy his wealth when he will be no more, and mindful of mortality, he has consulted several friends how he may best dispose of his property; whether he shall take that honour upon himself, or resign it to lovely Deparca. As they appear either unable, or unwilling to advise him, and he cannot well be called *compos mentis*, (submitting mostly to petticoat government) I trust you will look down with an eye of tenderness upon the *much to be pitied Cupidus*; visit and console him, that his wealth may not cause his "hoary hairs to go down with sorrow to the grave." But should you prefer his submitting the honour of disposing to Deparca, gently advise her not to lay out their store in a marble statue of Cupidus, lest that should too nearly resemble him in body and soul; nor in the erecting a monument to his memory, lest his former benevolence towards the neighbouring villagers should cause them to deface it.

COMMISERATUS.

Manchester, April, 1814.

MR. EDITOR,

I SHALL consider myself much obliged, if any of your contributors will favour me with a poetical translation of the following Epitaph. Yours, respectfully,

Gainsborough.

W. T.

Epitaphium

IN ELISAM,

REVERENDI JACOBI COX, S. T. P.

UXOR VALDE DEFLETAM,

QUE DIEM SUPREMUM OBIIT

17 MO CAL. AUG. MDCCCLXII.

ANNOS QUADRAGINTA ET ALTERUM

NONDUM NATA.

Blanda tibi requies tumuli, fidissima Conjux,
 Sit, blandusque sopor, dum tuba sancta vocet.
 Tunc O si tecum purus, felixque resurgam !
 Si mea sit rursus dextera juncta tuae !
 Judicis at summi timeam si conscius ora,
 Extendas trepidus, dulcis Elisa, manum.
 Me scelere indignum introducas purior ipsa,
 Sic eris in caelis, hic mihi quod fueras.

To the EDITOR,

THE following Latin Oration was delivered at Oxford, in honour of the Prince Regent, and the other illustrious visitors, by Mr. CROWE, the venerable Public Orator of that University, the effect of which was much increased by his serious and impressive delivery. As the production of an eminent classical scholar, its insertion in the Quarterly Visitor, will, no doubt, be acceptable to your readers: some of whom, I hope, will favour the public with a translation.

G.

ORATIO

HABITA IN THEATRO SHELDONIANO OXONIÆ,

Die 15 Junii, A. D. 1814,

A GUILIELMO CROWE, LL. B.

Publico Univ. Oratore.

Seruissime Princeps, dilectissimi Regis nostri vicem
 gerens, vosque augustissimi Reges, duces invictissimi,
 illustrissimi Hospites.

QUANTUM hodierno die gaudium universi capiamus, ego
 licet sileam res ipsa declarat; cum propter adventum vestrum optatissimum, non modo homines omnium ætatum et
 ordinum, sed etiam moenia, ipsa videantur, atque urbis
 tecta exultare. Magno sane honore et incredibili lætitia
 cumulastis Academiam Oxoniensem, quod eam visere
 dignati estis, quod hoc potissimum tempore, cum vobis
 non solum ut hospitibus gratulari possimus, verum etiam
 ut servitoribus nostris gratias agere meritissimas, ideo
 quod per eximiam virtutem vestram, a gravissimo bello
 salvi tandem et liberati sumus. Jam vero ille vester tot

potentissimorum Regum et Principum concessus perfundit hæc loca lumine quodam novo, et splendido, et quale nunquam antehac huic Academiæ, praeter hanc nulli affulxit. At non iū sumus profecto, qui nosmetipsos honore tali dignamur; neque tam arroganter quicquam a me dictum aut conceptum esse velim: cum autem mente repeto tot viros prætantissimos, qui omni genere scientiarum hic floruerunt, tot Principes et Reges Collegiorum nostrorum aut fundatores, aut ipsos disciplinis nostris instructos, ante omnes vero magnum illum Alfredum, a quo, Tu Princeps augustissime, genus ducis tuum, cuiusque sceptri hæres tu es amplissimus, Alfredum illum, quem conditorem Academiæ nostræ vindicamus, tum vero de dignitate ejus dissimulare non licet. Quin Ipse, si nunc adasset, jure optimo posset de Academia gloriari sua. Quapropter, oro, liceat mihi vicem ejus sustinere paulisper, dum voces proferam in persona graviori, et digna quam vos, Augustissimi Reges, attente audiatis. Eum igitur putatote vobiscum sic loqui.

Quam aspicitis Academiam, Hospites illustrissimi, omnium fere quæ exstant antiquissimam, ego princeps formavi. Postquam enim crudelissimum hostem debellasse, (quemadmodum Vos nuper fecistis) nec prius neque sanctius quicquam habui quam ut sedem quandam in regno meo stabilirem, ubi literæ humaniores, et scientiæ, et pacis artes coli possint; sciebam enim quantum hujusmodi studia ad summi Dèi honorem, quantum ad humani generis felicitatem, conferre valeant. Sperabam quoque tam honestam operam a me inchoatam, ab aliis post me Regibus et Principibus viris auctam et amplificatam fore; tum vero partem istius gloriæ ad me redundaturam. Nec me fecellit mea spes. Hæc est illa inclyta Oxonia, cuius nomen etiam ad ultimas gentes et populos remotissimos pervenit: cuius ego alumnus, tanquam militibus meis usis, multas de barbarie, de inscitia, de impietate, victorias reportavi; plurima porro litterarum posui tropæa et monumenta, quæ nulla delebit vetustas, nulla unquam obscurabit oblivio.

Hæc Alfredo fas esset magnifice prædicare: nos humilia et sentire et loqui decet. Nunc autem a Vobis, Augustissimi Hospites, pectimus ac etiam oramus, ut qua benignitate huc advenistis ad Academiam nostram visen-

dam, eadem hic excipere velitis, que officii et reverentiae gratia facimus. Parva quidem sunt, sed ex animis gratissimis proficiscuntur, sed propensiissima voluntate persolvimus, sed justissima de causa vobis debemus: quoniam, ut tranquille space jam fruamur, quod cum studiis nostris apprime accommodatum, tum maxime optandum erat, id vestris, Augustissimi Principes, consiliis prudentissimis, vestra, Duces fortissimi, admirabili et poene divina virtute, et nobis, et totias Europae gentibus et nationibus est effectum.

Poetry.

ELEGIAC STANZAS,

Written in a secluded and solitary situation.

AMID the wood, where oaks their branches spread,
On daisies sweet, and flow'ry turf reclin'd,
I find from cank'ring care a downy bed,
And give my grief and sorrows to the wind.

These ample woods that clothe the valley's sides,
The Western breeze that o'er the landscape blows,
The crystal stream that o'er the pebbles glides,
Soothe each tumultuous passion to repose.

No more I think of patient merit scorn'd,
No more by great men's frowns or pride oppress'd,
Friendship that's false, and *Love* that's unreturn'd,
Now blunted, strike on my unruffl'd breast.

The stormy passions, that in folly's round,
A dread dominion o'er the bosom keep;
That oft o'erleap the space of reason's bound,
By these soft fanning gales are lull'd aslcep.

No more the frenzy'd impulse now I feel,
To taste enjoyment in the lap of pain,
To join the throng in madd'ning pleasure's reel,
Or the luxurious cup of Bacchus drain.

O world! a weak disciple of thy school,
I nurs'd with rapture hope's delicious dream;
And fondly echo'd this fallacious rule,
That "Honesty and Worth procure esteem."

I thought that *Wisdom* well might awe the crowd,
 That deeds of vice and folly were abhor'd,
 That *Virtue*, in her various actions proud,
 Might claim our praises as her least reward.

But each, a servile flatterer, meanly strives
 To varnish vices that should stain the breast ;
 While the broad stare that vacant folly gives,
 Is turn'd to beauty by a tinsell'd vest.

Scenes such as these disgusted I beheld,
 See idols that mankind themselves have made,
 Procure a homage by all-powerful gold,
 And from the poor get adulation paid !

Society ! thus govern'd and upheld,
 To thee were preferable the simple plan ;
 When in a happy state he roain'd the field,
 'Ere baneful lux'ry had degraded man.

O that 'twere mine to tread the ample green !
 To sport at ease in nature's simple joys !
 Where no ungen'rous wish might intervene,
 With *Friendship* pure, and *Love* without disguise.

Yarm.

CLERICUS.

CONTEMPLATION.

ONE night when whistl'ing through the trees,
 The blust'ring North wind blew ;
 And Cynthia seem'd as if afraid,
 The stormy scene to view ;

The murky clouds in grim array,
 Stern Boreas whirl'd along ;
 When thus a Bard, by care opprest,
 Pour'd forth his mournful song :—

“ Congenial to the heart of woe,
 Is elemental strife ;
 Methinks when tempests loudly roar,
 They soothe the ills of life :

Yet time was erst, when nights like this,
 Possess'd no charms for me ;
 But ah ! succeeding years have shewn,
 How chang'd the mind may be.

The murmur'ring rill, the beauteous grove,
 I pass unheeded by,
 And seek the church-yard, lone and drear,
 Where moulting mortals lie.

There oft, when' midnight's deepest gloom,
 This nether world pervades,
 I pensive muse amongst the tombs,
 And court the world of shades :

And oft I think, as wand'ring o'er
 The low and silent dead,
 That haply once like me might live,
 The turf on which I tread.

Man's life is as a winter's day,
 Denied the cheering sun;
 But Jove decrees what we must bear;
 And may his will be done."

G.

ON ATHEISM.

How weak the Atheist's argument—how odd—
 Who to be happy, first denies a God;
 Then, with too little faith, truth to believe,
 Can show too much—an error to conceive :
 So inconsistent, and his folly such,
 He trusts too little; while he trusts too much.
 A foe profes'd to God—Almighty's laws,
 Yet a blind bigot in the Devil's cause;
 He from free-thinking, hopes to gain some light,
 Thinks freely on all subjects, but the right;
 A hint there is a God, raises a doubt,
 And prejudice, puts weaker reason out;
 Of reason proud, by passion rul'd alone,
 Because he'd have no God, concludes there's none;
 Thinks chance, with blind effect, true order brings,
 And harmony, from wild confusion springs;
 Springs of itself—spontaneously all grow,
 And the created, are Creators too.
 Then immortality he'll disbelieve,
 Yet starts to think he cannot always live;
 Dreading it true, a future state denies,
 And while he laughs at death, with fear he dies;
 Despairing, launches to some future state,
 Repents his folly, but repents too late.

Guisbrough.

J. Y.

ON THE SLAVE TRADE.

SHALL Gaul wear the emblems of peace,
Yet traffic in sinews and bones!
Shall England, I say, acquiesce,
As if Negroes were timber and stones.

No; tell them that Negroes are men,
Endow'd with a rational mind;
Who, tho' they may differ in skin,
Oft excel the polite and refin'd.

O liberty! dear to my heart,
That crowns not the African's head;
What hand shall condolence impart,
When thy balmy pleasures are fled.

Without thee, what hopes have we left?
The victim from happiness torn,
Of nature's first blessing bereft,
Beholds with fresh horrors each morn.

No comforts for him beams the sun,
But vassalage clouds ev'ry joy;
As if but each moment begun,
He droops at his hateful employ.

Then, multiplied tortures increase;
With groans, big with anguish and pain;
O France! you but mock at a peace,
If thus your lost wealth you regain.

The muse droops her sorrowful head;
Humanity sickens with grief;
To England, by gratitude led,
Poor Africa flies for relief.

In the bosoms of Christians she regains,
On the broad, the firm basis of love;
Nor, till her lost rights she regains,
Will we cease the base deed to reprove.

For more than mere freedom we trust,
To give her the fountain of light;
To shew her the hope of the just,
And raise her from error's dark night.

Then join the compassionate host,
 To sever her heart-galling chains;
 And shout, 'till her sorrows be lost,
 In the music of liberty's strains.

For why should such tyranny be
 To fatten her barbarous foes?
 Shall blood pay for sugar and tea?
 And comforts be bought with repose?

No, rather let colonies fail,
 Than the howlings of man should pervade;
 And the lion and tiger prevail,
 Than the lions and tigers of trade.

Hull.

T. E. ABBOTT.

Answers to Queries.

(32). *Answered by Mr. GLENDENNING, Yarmouth.*

By the laws of Hydrostatics, a body weighed in air, (which is a fluid) loses a portion of its weight, equivalent to the weight of a similar volume of that fluid. In *summer* the heat dilates the air, and the same volume is necessarily lighter in proportion to the degree of heat; consequently the body loses less of its absolute weight, or is apparently heavier than in *winter*, when the air is more dense.

The same by Mr. WATERLAND, Thealby.

I suppose a body weighs more in summer than in winter, on account of the sun's being at a greater distance from the earth: it is then, with respect to the earth, in its distant focus; consequently, the attractive power of the sun will be diminished, and that of gravity, or weight, proportionally increased.

The same by Mr. HARRISON, Jun. Flixborough.

It is evident that bodies weigh more in rarefied air than they do in air that is dense. In summer, the air being reduced to a state of rarefaction, by the heat of the sun's rays, the resistance of the medium is less than it cons-

quently would have been, had the air not been in a rarefied state ; therefore, I conclude that is the reason why the weight of bodies is greater in summer than in winter.

Also by *Messrs. Baines, Putsey, and Spectator.*

(33) *Answered by Mr. Putsey, Pickering.*

As animals are furnished with a *panniculus adiposus*, replete with fat, which infests and covers all the fleshy parts, and screens them from external colds, plants are encompassed with a bark replete with fat juices, by means of which the cold is kept out, and, in winter, the spiculae of ice prevented from fixing and freezing the juices in the vessel. Hence it is that sort of trees remain green the year round ; because their bark contains more oil than can be spent and exhaled by the sun.

The same by Mr. BAINES, Jun. Horbury-bridge.

EVERGREENS, it is true, retain their leaves longer than other plants ; but they ultimately cast them. From observations made on the *holly* and *ivy*, it appears they are furnished with a new set of leaves every spring, which they retain the whole winter. The following spring they are easily distinguished from the new leaves, by their largeness, blackness, and languid appearance. In the succeeding winter most (if not all) of them fall off. I believe no substantial reason can be assigned why they do not cast their leaves, when other perennials do. Nature, it seems, has made them more hardy ; enabling them to stand the rigours of one winter, before they decay. In plants which shed their leaves annually, we observe some species cast them earlier than others ; this appears to be owing to their tenderness.

The same by Mr. YORKE, Guisborough.

WHENEVER the circulation of the sap is stopped, the leaf withers, dies, and falls off : this is the case with a number of trees, shrubs, and plants, every year.—On the contrary, the leaves of evergreens having a hard oily coat, the circulation of the sap is protected from the extremities of the cold ; and is permitted to circulate freely during the ravages of winter.

(34) *Answered by Mr. ENGLAND, Normanby.*

THE Right Rev. Bishop Watson remarks that the same appearance is observable on the outside of a silver (or other) vessel, into which iced water has been put, in summer time. As the Bishop's explanation of these appearances coincides with the opinions of the most eminent philosophers in Europe, in the process of evaporation, I shall quote his words: "These, and other appearances of the same kind, may be explained on the same principle. Warm air is able to retain more water in solution than cold air can; when, therefore, warm air becomes contiguous to the outward surface of a vessel containing cold liquor, it is presently cooled to a certain degree, and in being cooled it is forced to part with some of the water which it had dissolved, and this water, ceasing to be suspended by the air, attaches itself to the surface of the cold vessel."

The same by JUVÉNIS, Manchester.

It has been ascertained that the atmosphere contains a portion of water in solution, in the ratio of about one per c. Now, as water is converted into steam by heat, and may be again condensed by cold, I imagine that the extreme cold of the bottle and its contents, condenses the steam which is contained in the air immediately surrounding it; and this adheres to the surface of the bottle, in the form of watery vapour.

Also by *Messrs. Baines, Osmond, Putsey, Waterland, and Yorke.*

(35) *Answered by Mr. BAINES, Jun.*

CARBONIC acid is heavier than common air; and, consequently, occupies the lowest situations. It is disengaged in vast quantities, in the form of gas, by the decomposition of vegetables heaped together by the fermentation of wine and beer, by the putrefaction of animal matters, and by almost every species of combustion. It is found in various subterraneous places; as mines, coal-pits, cellars, tombs, &c. Now, it is well known that all acids have a strong

tendency to combination ; and as this is produced so plentifully and occupies the lowest situations, where lime-stone, chalk, magnesia alba, &c. are found, we are naturally led to conclude that it enters into combination with these calcareous substances. —

The same by Mr. YORKE, Guisbrough.

CALCAREOUS earth is formed from accumulated heaps of shells, the stony remains of marine animals, dispersed in various places, during the deluge ; when, as philosophy informs us, the whole surface of the earth was in a state of fluidity. Wherever lime stone has been dug, shells have been found ; from which circumstance we are led to conclude that a great part of the calcareous earth owes its origin to the above cause. From shells, therefore, it must have acquired the carbonic acid.

The same by JUVENIS, Manchester.

ATMOSPHERIC air, beside oxygen and nitrogen, (which are its chief ingredients) and several other substances, contains one part in a thousand of carbonic acid gas ; which calcareous earth, when exposed to the atmosphere, has the property of extracting.

Mr. Putsey also answered this query.

(36) *Answered by Mr. GLENDENNING, Yarmouth.*

WHAT uninformed mind can survey the amazing series of vast basaltic columns, in the county of Antrim, called the Giant's Causeway, can inspect the accuracy in their figures, the regularity in their joints, the niceness of their articulations, and refrain from concluding that the whole is a work of art ? But in answer to the question—who were the artisans ? the mind would necessarily infer, the strength of the artisans must have been superior to that of the present race ; or, in other words, the artisans were Giants. Thus, it is at least probable, the name originated. This conjecture is strengthened by the fact that the magnificent basaltic pillars, in the neighbourhood of *Ætna*, are called the *Rocks of the Cyclops* : for the Irish Giants and the Sicilian Cyclops were understood to have been equally *huge and athletic*.

Grammatical and Philosophical Queries.

(38) *By Midas, Driffield.*

IT is a well known fact that water poured on tar, or pitch, in a boiling state, sets it on fire; but when sand is applied to it, it extinguishes the fire: required the reason?

(39) *By Mr. MAFFETT, Plymouth.*

ARE *setter* and *tie* synonymous terms?

(40) *By JUVENIS, Manchester.*

ACCOUNT, on philosophical principles, for the rumbling noise and repeated echoes of thunder.

(41) *By SPECTATOR, Hull.*

IN some inland counties, also in gravel pits, shells and other marine productions are found. What reason can be assigned for this, as there is no account of these places ever having been covered with water?

(42) *By Mr. BAINES, jun. Horbury-bridge.*

WHENCE originates the intoxicating quality of fermented liquors?

(43) *By Mr. ENGLAND, Normanby.*

THE mixture of some substances produces cold: how is this effected?

(44) *By Mr. YORKE, Guisbrough.*

HOW are we to account for the red coral, which is so commonly found at sea, never being found in the fossil world; whilst, on the contrary, the white fossil coral is frequently found?

(45) *By Mr. YOUNG, Manchester.*

ARE ideas innate? if not, why does not an ideot become wise by acquirement?

Answers to Mathematical Problems.

(58) *Answered by Messrs. G. LENG, HINE, PUTSEY, WINWARD, and WISEMAN.*

ADD x to each side of the equation, and $x + 6)^2 + 2\sqrt{x} \times x + 6 + x = x + \sqrt{x} + 138$, or $(x + \sqrt{x} + 6)^2 = x + \sqrt{x} + 6 + 132$; $\therefore (x + \sqrt{x} + 6)^2 - (x + \sqrt{x} + 6) = 132$, a quadratic; hence $x = 4$.

The same by Messrs. LAMPLUGH, PAGE, and YOULE.

By adding x to each side of the equation, and extracting the sq. root $x + 6 + \sqrt{x} = \sqrt{x + \sqrt{x} + 138}$.

Now, for $x + \sqrt{x}$, put y , and the equation becomes $y + 6 = \sqrt{y + 138}$, or $y^2 + 11y = 102$; $\therefore y = 6$; and $x = 4$.

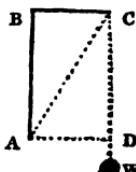
The same by Messrs. BAINES, jun. GAWTHORP, RYLEY, and WHITLEY.

PUT $z = \sqrt{x}$; then the equation becomes $z^4 + 2z^3 + 12z^2 + 11z - 102 = (z^2 + z - 6) \times (z^2 + z + 17) = 0$. From the first equation $z = 2$, or -3 ; and, from the second, $(+ \sqrt{-67} - 1) \div 2$; which expressions exhibit all the roots of the biquadratic equation.

Also by *Messrs. Chapman, Longdin, Maffett, Mair, Stringer, Tindall, Winward, and Yorke.*

(59) *Answered by Messrs. ENGLAND, (Normanby-School, Burton-Stather) PUTSEY, RYLEY, and WISEMAN.*

LET ABC represent the crane; then, if the force or weight (160), suspended at C, be denoted by AB (20), $AB (20) : 160 :: BC (14) : 160 \times 14 \div 20 = 112$, the force or stress, on the pivot B, in direction BC.



The same by Mr. YORKE, Guisbrough.

IF ABC represent the crane, W the weight, suspended at C, P the stress on the pivot B; then $W \times BC \div AB = P = 112$ cwt. For, by Mechanics, $W \times S. \angle ACW = P \times S. \angle ACB$.

The same by Mr. GAWTHORP, Leeds.

DRAW $AD \parallel BC$, meeting CW in D ; then $AD = BC$; and BAD may be considered as a beaded lever, having the weight W acting at D : hence $W \times AD \div AB = 112$ cwt. the stress at B .

Also by *Mess. Baines, Chapman, Froude, Harrison, Hine, Lamplugh, G. Leng, Longdin, Maffett, Mair, Page, Stringer, Treeby, and Winward.* — —

(60) *Answered by Messrs. MAFFETT, PUTSEY, and TREEBY.*

By the collision and the laws of falling bodies, $1^2 : 3^2 :: 213 : 1917$ feet, the height above the plane; consequently $1917 - 213 = 1704$ feet, the height above the *Minster*. Moreover $1917 + 2(213 + \frac{213}{9} + \frac{213}{81} + \text{ad infinitum}) = 2996\frac{1}{4}$ feet, the space passed over by the ball.

The same by Messrs. FROUDE, HARRISON, KILLINGBECK, and YORKE.

LET x denote the height, above the horizontal plane, whence the ball must fall; then, per problem, $x + 9 = 213$; $\therefore x = 1917$; and the spaces passed over will be equal to the series $x + 2x + 9 + 2x + 81 + \text{&c. ad inf.}$ The sum of which is $x + x + 4 = 2996.25$ feet.

Also by *Messrs. Baines, Chapman, England, Gawthorp, Hine, G. Leng, Longdin, Mair, Ryley, Winward, Wiseman, and Youle.* — —

(61) *Answered by Messrs. BAINES, HINE, and WHITLEY.*

PUT $a = 10$ feet, the plane's height, $P = 16$ st. $W = 12$ st. and $x =$ plane's length; then, by mechanics, the accelerating force of W , down the plane, $= \frac{1}{2} W + x$: hence the moving force of the two bodies is $= (Px - \frac{1}{2} a W) \div x$; and the accelerating force is $= (Px - a W) \div (Px + Wx)$; but the time of describing the plane varies as $\sqrt{x + \text{acc. force}} = \left(Px^2 + Wx^2 \div Px - a W \right)^{\frac{1}{2}}$

a minimum; therefore $x^2 \div Px - a W =$ a minimum; which, put into fluxions, &c. gives $x = 2aW \div P = 15$ ft.

Also by *Messrs. England, Froude, Gawthorp, Harrison, Killingbeck, Lamplugh, G. Leng, Longdin, Maffett, Mair, Page, Putsey, Ryley, Stringer, Treeby, Winward, Wiseman, Yorke, and Youle.*

(62) *Answered by Mr. GAWTHORP, Leeds.*

LET $x = 2y$; then the formulæ become $7y^2 - z^2 - yz$, $(y + z)^2$ and $z^2 + yz - 5y^2$. Put the first $= m^2$, and the third $= n^2$: thence $2y^2 = m^2 + n^2$. Take $m = 7n$; hence $y = 5n$, and the first equation will be $175n^2 - 5nz - z^2 = 49n^2$; whence $z = 9n$; $\therefore x = 10n$, and $y = 5n$. If $n = 1$, the numbers are 10, 5, and 9.

Also by *Messrs. Darby, Putsey, Ryley, and Yorke.*

(63) *Answered by Messrs. PUTSEY, MAIR, and RYLEY.*

DRAW the given circle, likewise two indefinite tangents to it, intersecting each other, at right angles. On the said tangents form a square, whose side = the diameter of the given circle—the diff. between the diameter and side of the inscribed square; then, through that angle of the square which meets the hypothenuse, draw a tangent to the circle, terminating in the indefinite lines, and the triangle will be completed.

Also by *Messrs. Baines, England, Froude, Gawthorp, Glendenning, Harrison, Hine, Killingbeck, Lamplugh, G. Leng, Maffett, Page, Stringer, Treeby, Winward, Wiseman, Yorke, and Youle.*

(64) *Answered by Messrs. FROUDE, HARRISON, KILLINGBECK, and TINDALL.*

LET $n = 7854$, and x = the less diam. of the frustum; $\therefore c - x$ = the greater; and $n dx^2 \div 3$ = the solidity of the conical part; then, Hutton's Course, vol. 1, pa. 336, $x^3 : ndx^2 \div 3 :: c - x^3 : c - x^3 \times nd \div 3x$ = the solidity of the whole cone. Now $c - x^3 \times nd \div 3x - ndx^2 \div 3 :: (c - x^3 - x^3) \times nd \div 3x$ = the solidity of the frustum. Hence, (per problem) $c - x^3 - x^3 \times nd \div 3x : ndx^2 \div 3 :: a : b$; $\therefore b \times c - x^3 - x^3 = ax^3$; whence $x = c^3 \sqrt{b} \div \sqrt[3]{a + b} + \sqrt[3]{b}$. The rest is evident.

Also by *Messrs. Baines, Chapman, Gawthorp, England, Hine, Lamplugh, G. Leng, Longdin, Maffett, Mair, Page, Putsey, Ryley, Stringer, Treeby, Winward, Wiseman, Yorke, and Youle.*

(65) *Answered by Messrs. G. LENG, LAMPLUGH, MAFFETT, PAGE, and TREEBY.*

THE given triangle is right-angled; therefore, its area $= 24 \times 7 \div 2 = 84$; and the natural sine of the less acute angle $= 7 \div 25 = .28$. Now, as the required triangle will be isosceles (vide Theo. 7. Simp. *max. et min.*) its base will be opposite the less acute angle. Let x = one of the equal sides; then $x^2 \times .28 \div 2 = 42$; $\therefore x = 17.3205$, &c. Hence the base $= 4, 9$ nearly.

Also by *Messrs. Baines, Chapman, Gawthorp, England, Froude, Harrison, Hine, Killingbeck, Mair, Putsey, Ryley, Tindall, Treeby, Winward, Wiseman, Yorke, and Youle.*

(66) *Messrs. Baines, England, Froude, Harrison, Hine, Killingbeck, G. Leng, Maffett, Mair, Putsey, Ryley, Tindall, Treeby, Winward, Wiseman, and Yorke, answered this problem geometrically, by referring to Simpson's Geometry, pub. 8, or Hutton's Course, case 2d, prob. 2, page 164.*

Messrs. Gawthorp, Chapman, Lamplugh, Page, and Youle, solved it algebraically thus:—The areas of similar triangles being as the squares of their like sides, or perpendiculars. If the perpendicular, let fall from the vertex to the base of the triangle, be put $= p$, the base $= b$, and Δ 's area $= a$; then $a : p^2 :: a \div 5 : p^2 \div 5$; and $p + \sqrt{5} = \text{alt. of the first part}$. Again, $a : p^2 :: 2a \div 5 : 2p^2 \div 5$; and $p\sqrt{2} \div \sqrt{5} = \text{distance of the base of the second part from the vertex}$. By proceeding in the same manner, the distance of the base of the third part, from the vertex $= p\sqrt{3} \div \sqrt{5}$, and of the fourth $= 2p \div \sqrt{5}$.

(67) *Answered by Mr. GLENDENNING, Yarmouth.*

Let P represent the elevated pole; Z the observer's Zenith; m, n the places of the sun, at the first and n second observation, respectively.—

 Then (Mauduit's Trigonometry, ch. 4, prob. 4,) $\tan. Pm = R^2 \sin ZP \div (\cot. m ZP \sin m PZ + \cos. ZP \cos. m PZ)$; whence, operating with the value of the cot. of Pm , derived from that of the tang.; and

recollecting that $\cot. m Z P$, as well as $\cot. n Z P$, is negative, because the angles $m Z P$, $n Z P$ are both obtuse, we obtain $\cot. P m \sin Z P (= \cot. P n \sin. Z P) = \cos. Z P \cos. m P Z - \cot. m Z P \sin. m P Z = \cos. Z P \cos. n P Z - \cot. n Z P \sin. n P Z$. Hence $\cos. Z P = (\cot. n Z P \sin. n P Z - \cot. m Z P \sin. m P Z) \div (\cos. n P Z - \cos. m P Z) = .8069922 =$ the sine of $53^\circ 48' 11, 14''$, the observer's latitude. Ultimately $\tan. P m = R^2 \sin. Z P \div (\cos. Z P \cos. m P Z - \cot. m Z P \sin. m P Z) = 2.4938673 = \cot. of 21^\circ 51'$, the sun's declination, which is of the same name as the latitude; if these were north, the corresponding day is 31st May, or 13th July, 1813; but, if South, 11th January, or 1st December, presuming that the observer was not so distant from the meridian of Greenwich, as materially to affect the declination.

The same by Messrs. BURDON and RYLEY.

LET a and b denote the sine and cos. of $L m P Z (52^\circ 30')$; c and d the sine and cos. of $L n P Z (22^\circ 30')$; $-e$ the cot. of $L m Z P (107^\circ 47')$; $-f$ the cot. of $L n Z P (143^\circ 3')$; and x the sine of $Z P$, the comp. of the required latitude. Then, Em. Trig. case 9, the tang of the sun's declination, at first observation was $b \sqrt{1-x^2} \div x - e a \div x$; and the tang, at second $d \sqrt{1-x^2} \div x - e f \div x$; hence equating the above expressions, &c. $\sqrt{1-x^2} = e f - e a \div d - b = .8069922$, the natural sine of $53^\circ 48' 11''$ the latitude sought; and the declination $21^\circ 51' N.$ answering to the 31st of May, or the 13th of July.

Also by Messrs. Baines, Gawthorp, Hine, G. Long, Maffett, Mair, Winward, Yorke, and Youle.

(68) *Answered by Messrs. HARRISON, MAIR, WINWARD, WHITLEY, and YORKE.*

LET $x =$ less diameter; then $60^2 : 40 :: x^2 : x^2 \div 90 =$ abscissa; $\therefore 40 - x^2 \div 90 =$ height of frustum; whose solidity is $(60^3 - x^3) \div (60 - x) \times (3600 - x^2) \div 270 \times 7854$, a maximum, or $216000 x - 60 x^3 - x^4$ a maximum; which, put into fluxions, and reduced, gives $x = 27,9246$; consequently, the height of the frustum = 31,7042.

Also by *Messrs. Baines, Froude, Gawthorp, Hine, Lampugh, G. Leng, Maffett, Page, Putsey, Ryley, Treeby, and Youle.*

(69) *Answered by Messrs. GAWTHORP, HINE, and RYLEY.*

By transposition $y^2 \dot{x}^2 = a \dot{y}^2$ plus $x \dot{y}^2 - (2 a \dot{x} \dot{y} \dot{y} \times a$ plus \dot{x}) plus $a^2 y^2 \dot{x}^2$ plus $a^2 \dot{y}^2 \dot{x} \dot{x}^2$. This equation, divided by a plus \dot{x} , gives $y^2 \dot{x}^2 \div a$ plus $\dot{x} = \dot{y}^2 - \frac{2 a \dot{x} \dot{y} \dot{y}}{a + \dot{x}}$ plus $a^2 y^2 \dot{x}^2$; the square root of which is $y \dot{x} \div \sqrt{a + \dot{x}} = \dot{y} - a \dot{y} \dot{x}$; or $\dot{x} \div \sqrt{a + \dot{x}} = \dot{y} \div y - a \dot{x}$: the fluent of which is $2 \sqrt{a + \dot{x}} + a \dot{x} = h. l. y$. Suppose \dot{x} and y to vanish together, the equation will become $2 \sqrt{a + \dot{x}} + a \dot{x} - 2 \sqrt{a} = h. l. y$.

Also by *Messrs. Maffett, Winward, and Yorke.*

(70) *Answered by Mr. GLENDENNING, Yarmouth.*

ANALYSIS. Suppose it done; that AD is the straight line given

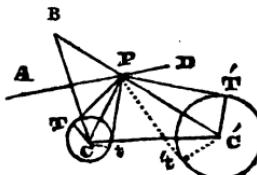
in position; C, C' the centres of the circles given in magnitude and position, and P the point from

which, if tangents PT, PT' be drawn, their aggregate is a *minimum*.

Draw CT, CP , and CT', CP' . Then, because the radii CT, CT' are constant, the secants CP, CP' are directly as the tangents TP, TP' ; therefore, when the aggregate of the former is a *minimum*, the aggregate of the latter will likewise be a *minimum*. But the aggregate of the secants

CP, CP' is a *minimum* when the angles CDA, CPD are equal (Simpson on the *max. et min.* of Geometrical quantities, Theor. 1) whence this

Construction. From C , upon AD , let fall the perpendicular CA , produce CA until AB is equal to AC , draw BC , which will intersect AD in the required point P .

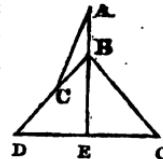


(71) *Answered by Messrs. BAINES, FROUDE, G. LENG, MAFFETT, TREEBY, and WHITLEY.*

THE declination of the sun, at the first observation, was $15^{\circ} 19' 12''$. Now, having given the sun's declin. the latitude of the place, and the hour, the alt. of its centre is found to have been $15^{\circ} 48' 16''$; and $15^{\circ} 48' 16'' + 3' 20''$ (ref.) $+ 16' 12''$ (sun's semid.) $- 8''$ (parallax) $= 16^{\circ} 7' 40''$, the apparent alt. of sun's upp. limb, at first observation.

Again, $35^{\circ} 40' - 15^{\circ} 20' 46''$ (sun's dec. at 2d obs.) $= 20^{\circ} 19' 14''$, the alt. of sun's centre at noon; and $20^{\circ} 19' 14'' + 16' 12'' + 2' 31'' - 8'' = 20^{\circ} 37' 49''$, the app. alt. of sun's upp. limb. at noon.

In the triangle ABC, are given AB = 15 yds. BC = 60, $\angle A = 69^{\circ} 22' 11''$, to find $\angle C = 13^{\circ} 31' 50''$, and AC = 63, 619. Again, in the $\triangle ACD$, are given all the angles and side AC, to find AD = 94,856. Now, in the right angled triangle DEA, are given AD, and $\angle A$, to find DE = 91,123; and $2 \times DE = 182,246$ yards, the diameter of the hill's base.



** The line AD is omitted, which the reader will please to supply.

Also by *Messrs. Gawthorp, Harrison, Hine, Longdin, Mair, Putsey, Ryley, Winward, Wiseman, Yorke, and Youle.*

New Mathematical Problems.

(72) *By Mr. BAINES, Jun.*

AT the South angle of a triangular field, in lat. $53^{\circ} 42'$ N. stands a tree, 50 yards high, whose shadow just reached along the West side of the field, at nine A. M. July 9th, 1814, and at 20' past four in the evening of the same day, it reached along the West side: required the area of the field?

(73) *By Mr. MAFFETT, Plymouth.*

A PENDULUM rod, void of gravity, 40 inches long, at the extremity of which is fixed a weight of 30 oz. Where, on the rod, shall a weight of 20 oz. be fixed, so that the rod may vibrate the quickest possible?

(74) *By Mr. TREEBY, Plymouth.*

THERE is a conical glass, whose base-diameter is 2 feet, and alt. 5, fixed with its vertex downwards: determine the lowest point, in the axis, to which a globe of 18 inches diameter, when put ~~in~~ at the top, can descend; also the solidity of the segment of the globe, formed by a plane, passing through the points of contact, parallel to the horizon.

(75) *By Mr. YOULE, Sheffield.*

IN latitude $53^{\circ} 28'$ is a circular fish pond; and on its circumference is erected a pole. At nine o'clock, May 20th, 1814, I measured that part of the shadow of the pole which fell without the pond, and found it = 40 yards; and at noon on the same day, the shadow coincided with the diameter of the pond: hence I would know the diameter of the pond, and the height of the pole.

(76) *By Mr. CHAPMAN, Land Surveyor, Hull.*

To find the thickness of an upright rectangular wall, necessary to support a body of water, the water being 10 feet deep, and the wall 12 feet high; also the specific gravity of the wall to that of the water, as 11 to 7.

(77) *By Mr. TINDALL, West-street, Hull.*

THE difference of two numbers is 8, and the difference of their fourth powers is 14560; required the numbers by a quadratic equation?

(78) *By Mr. G. LENG, Hull.*

ADMIT that on June 21st, the body of the sun be observed to rise out of the horizon, in eight minutes time; what is the latitude of the place?

* * This is the 7th Question L. Diary, 1790, the answers to which differing from each other, we are requested to re-publish it for further consideration.

(79) *By Mr. WHITLEY, Rotherham.*

IN any plane triangle, the centre of the circumscribing circle, the centre of gravity, and the intersection of the perpendiculars, from the angles upon the opposite sides, are in the same straight line. Required a demonstration.

(80) *By Mr. FORD, Burton Pidsea.*

GIVEN one of the equal sides of an isosceles triangle = 10, and the diff. of the radii of its circumscribing and inscribed circles = 3 chains; to determine the area of the triangle.

(81) *By Mr. WISEMAN, Hull.*

THE sides of a triangle are 25, 24, and 7: required the nature of the curve, which, passing through the angular points, adjacent to the longest side, will divide the triangle into two equal parts.

(82) *By Mr. GLENDENNING, North Yarmouth.*

A FRIEND upon a late visit, directed my attention to a narrative in an "Account of several late Voyages and Discoveries, London, 1711," purporting, that a Capt. Goulden told King Charles the Second, that about 20 years before, he had been as far as the 89th degree of North latitude.— "Now," said my friend, "how far would it have been requisite for the Captain to have sailed, between the S. and W. for instance, before his difference of longitude, as found by middle latitude sailing, and that found by Mercator's sailing, were 500 and 1000 miles respectively?"

(83) *By Mr. PUTSEY, Pickering.*

AT a tavern one night, in a snug little nook,
A cylindrical pot I espy'd on a hook;
Its depth was six inches, diameter three,
As thin it was made as could possibly be;*
One inch from the top it was freely suspended;
To find what 't would hold, thus a guager pretended:
He dipp'd, and he squar'd much, to shew himself clever,
But all would not do—he knew nought of the lever;
He then pour'd in water, buoy'd up with ambition,
To prove his work right; but the change of position
Which the vessel assumed, made him grow very hot:
He declar'd no man living could guage such a pot.
Learned guests, if the myst'ry you'll try to explain,
You'll a favour confer on the "Knight of the Cane."

* To be considered without weight.

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“**DELECTANDO PARITERQUE MONENDO.**”

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Vol. II.

Mr. EDITOR,

YOUR little Miscellany has afforded me much entertainment, particularly the Biographical part. Presuming that a Memoir of our late Astronomer Royal, the Rev. Nevil Maskelyne, D. D. would be acceptable to your scientific readers, I have culled, from Dr. Rees's Cyclopædia, (the labours of the learned Dr. Kelly,) &c. such materials as, I trust, will prove entertaining.

Yours, respectfully, **ASTRONOMICUS.**

Hull, October 1st, 1814.

He may be considered fortunate, who, by the blessing of heaven, has either performed such actions as deserve to be recorded, or written such things as merit attention; but he must be esteemed completely blessed, who is favoured with the double advantage. In this list stands pre-eminently, the Rev. Nevil Maskelyne, D. D. Astronomer Royal, who spent a long life in devising means for the preservation of the lives and property of his fellow-subjects.

NEVIL MASKELYNE, (D. D. F. R. S. &c. Astronomer Royal) descended from an ancient family, long resident in Wiltshire, was born in London, on the 6th of October, 1732. At the age of nine years, he was placed at Westminster school; where he continued till he was fifteen, and made great progress in classical learning; though for optics and astronomy he shewed an early predilection,

which was considerably increased by his seeing the great eclipse of the sun, July, 1748. It is said this eclipse produced the same effect on Lalande, who was only three months older than Dr. M. The annular eclipse of the sun, April 1st, 1764, in like manner, incited the late Mr. George Sanderson to the study of astronomy. From the effects of these celestial phenomena, astronomy and general science have been greatly benefited : Lalande wrote much, was long a professor, and formed many adepts ; Dr. M. wrote less ; but has left us, in his calculations and observations, the most valuable monuments of the kind extant ; Sanderson, though in humble life, did much in mixed mathematics, in several periodical publications.

Dr. M. now perceived that a fundamental knowledge of mathematics was necessary to enable him to distinguish himself in the path he had determined to pursue ; therefore he earnestly turned his attention to the study of geometry and algebra—the keys to mathematical learning ; and, in a short time, acquired a considerable knowledge thereof.

In 1749, he went to the University of Cambridge, and entered at Catherine-hall ; but soon removed to Trinity-college, where he pursued his favourite studies with additional success. On taking his first degree, he received distinguished honours from the University. In 1756, he became a fellow of his College, and took his Doctor's degree in 1777 ; therefore, he will be invariably mentioned under the title of Doctor, as that by which he has been long known to the scientific world. He was ordained to the curacy of Barnet ; where he officiated some time, and devoted most of his leisure to practical astronomy. In 1758, he was elected a fellow of the Royal Society, and enriched the transactions with important contributions. This learned body, at that time, paying particular attention to astronomical and mathematical subjects, selected him as the most proper person to go to the Island of St. Helena, to observe the transit of Venus over the sun's disk, June 6th, 1761. As this phenomenon might establish an important element in astronomy, (the sun's parallax), the attention of philosophers was excited, in different countries, and preparations were made for observing it with accuracy. Two other astronomers, (*Mr. Charles Mason*, and *Mr. Jeremiah Dixon*,) were

sent to Bencoolen, for the same purpose ; and his Majesty (George II.) granted supplies for these expeditions. The French King also sent astronomers to Pondicherri, to the Island of Roderigo, and to the North of Siberia.

On the Island of St. Helena, Dr. M. remained ten months, making astronomical observations, and trying philosophical experiments ; but his observation of the transit of Venus was not completely successful, owing to the cloudy state of the weather ; yet this voyage proved far more important and useful to this country than was originally intended : it afforded him an opportunity of taking *lunar observations* effectually. This method of finding the longitude, at sea, has been long contemplated as a grand desideratum in navigation ; and plans had been suggested, and preparations made for that purpose, by Flamstead, Newton, La Caille, Euler, Halley, Bradley, Mayer, and others ; but the honour of reducing their theories to successful practice, was reserved for Dr. Maskelyne. This he was enabled to do, by means of Hadley's quadrant ; and by professor Mayer's Lunar Tables, for which a parliamentary reward of £3000 was afterwards given, on Dr. Maskelyne's report of their correctness. During the voyage both outward and homeward, he exercised the officers on board, in taking lunar observations, and taught them to clear the distances from the effects of parallax and refraction ; and thence to find the longitude within certain limits.

It is a subject of regret, that sailors are so often uninformed on these important points ; and that immense property and valuable lives should be intrusted to the care of men totally ignorant of *spherics* and *nautical astronomy*. It has been remarked with propriety, that every mariner, intrusted with authority, should, at least, understand *Dr. Kelly's practical introduction to spherics and nautical astronomy*. What can be more gratifying to an intelligent seaman, after having been tossed about for many days, in the trackless ocean, to behold the lamps of heaven, (the sun and moon) hung out, like kind friends, to enable him to ascertain the situation of his ship within a few miles. He and his associates would immediately

adjust their instruments, take the necessary observations, and find the latitude, longitude, &c. ; then proceed with confidence to the place of their destination. It is not necessary to describe the perplexity of a person in a similar situation, possessed only of as much knowledge of navigation as could be compressed into a modern *six-penny pamphlet*. Yet a man of this stamp is not unfrequently intrusted to conduct a ship through the immeasurable ocean, which contains property to the value of forty or fifty thousand pounds. Lately, it is reported, a whale-ship brought up three hundred miles from its intended port ;—the master alledged that the weather had been adverse, and that he had committed *a few small errors* in his reckoning. Nay, it has been asserted, that the part of a crew, some years ago, was landed in Norway: the master mistaking that country for the Orkneys !— Should these reports be correct, they proclaim aloud the necessity of *theoretic navigation* and *practical astronomy* ; that seamen may be convinced that the uncertainty in determining the longitude can scarcely ever exceed half a degree, and seldom ten miles, when calculations from Mayer's, and modern tables, are used.

While on the Island of St. Helena, Dr. M. made accurate observations on the tides, the variation of the compass, and the comparative gravity of bodies there and at London. He also observed the annual parallax of Sirius, and the horary parallaxes of the moon. The results of these operations are inserted in the Philosophical Transactions of the above period. Soon after his return from St. Helena, he published his well-known work, entitled “The British Mariner's Guide,” which contains, among various new and practical illustrations and articles in nautical astronomy, rules and examples for working the lunar observations; but in order to shorten and simplify these laborious operations, other tables and calculations were still wanted, which he afterwards supplied by his Nautical Almanac, and requisite tables.

In 1763, he made a voyage to Barbadoes, for the purpose of finding the longitude of that island, by astronomical observations; also he determined the accuracy of Mr. Harrison's new time-keeper; likewise to try Mr. Irwin's marine-chair, which was invented for making

steady observations at sea ; but it proved ineffectual. He, in the course of his voyage, took lunar observations with Hadley's new and curious sextant ; and determined the longitude, by the eclipses of Jupiter's satellites, and the occultations of fixed stars, by the moon.

In 1764, the office of Astronomer Royal became vacant by the death of Mr. Bliss, who had survived his appointment of successor to Dr. Bradley, only two years. Dr. Maskelyne's celebrity pointed him out as the most competent person to fill the situation. He was esteemed by the Royal Society as a profound mathematician, and an able astronomer ; while his experience, at sea, and especially his success in proving the practicability of finding the longitude by lunar observations, evinced that he was peculiarly qualified to carry into effect the purpose for which the Royal Observatory had been established—that of preparing tables for finding the longitude at sea. From want of this knowledge, it was said, that not only single ships but whole fleets had been lost, which induced government to offer immense rewards for practical methods of determining the problem : when Mr. Flamstead, the first Astronomer Royal, was appointed by King Charles II. "to apply himself, with all diligence, to the rectifying the tables of the motions of the heavens, and the places of the fixed stars, in order to find out the much desired longitude at sea, for the perfecting the art of navigation ;" these were the words of his commission, which have been continued to his successors.

During Mr. Flamstead's life, a part of his observations was published ; but a corrected edition was given to the public by his heirs. After his death, in 1720, the celebrated Dr. Halley succeeded him, and pursued the same plan, with more correct instruments, till 1750 ; but his observations have not yet been laid before the public.—Unfortunately, when the place of Astronomer Royal was founded, it was omitted to enact that his observations should be published.

Queen Caroline, it is said, observed to Dr. Halley, that she thought the salary of the Astronomer Royal was not adequate to so incessant an employment, and signified her desire to have it increased. Dr. Halley modestly resisted

the proposal, alleging, that if the appointment was considerable, it would, perhaps, not be given to an astronomer. This disinterested precaution of Halley, justly deserves admiration; but it is to be lamented, that when he waved self consideration he did not embrace the opportunity of requesting a fund for printing the observations: the Queen would doubtless have acceded to it, and he would have obviated the disputes, which, during forty years, prevented the appearance of his labours. Dr. Halley permitted a favourable opportunity to escape; Dr. Maskelyne was more fortunate: he procured that his observations should be annually printed at the expence of the Royal Society; and, it was by these means that he deserved to be, as he really was forty years, the chief, and, as it were, the regulator of astronomers.

Dr. Bradley was successor to Dr. Halley. He renewed the instruments, perfected the methods, and gained celebrity by his discoveries. He did not publish any thing, and his heirs asserted that his manuscripts were the property of the family. Forty years elapsed, after his death, before astronomers became possessed of his labours.

On the 16th of February, 1765, was announced, in the London Gazette, the appointment of Dr. Maskelyne to the office of Astronomer Royal, which gave universal satisfaction, as being an event of great national importance. It is not unnecessary to observe, that this office includes a seat at the Board of Longitude—a board formed of commissioners, who are appointed for examining, trying, and judging all improvements relating to the longitude.

During the long period of Dr. Maskelyne's official services, his time may be considered as chiefly occupied either at the Observatory, the Board of Longitude, or the Royal Society. His biography, therefore, like that of most scientific men, consists chiefly in a history of his labours; and as they are numerous, and likewise well known to the astronomical world, it will only be necessary to state them in a summary manner, referring the readers, occasionally, to publications where they are more particularly detailed.

The plan of the "Nautical Almanac and Astronomical Ephemeris," he laid before the Board of Longitude, soon after his appointment; and the 1st volume was for 1767.

Fifty volumes, up to the year 1816, inclusive, were calculated under his direction, and universally allowed to be the most useful work on practical astronomy ever published. Even foreign astronomers have generally and implicitly adopted its computations, and acknowledged its superior accuracy.

In 1767, he published an auxiliary work, entitled, "Tables requisite to be used with the Nautical Almanac, in order to find the Longitude at Sea;"—a performance well known to mariners, by the name of "The Requisite Tables;" which has passed through several editions, and been successively enlarged. After this he published, by order of the Commissioners of Longitude, Mayer's Tables—to which he prefixed, a Latin preface; also Latin and English explanations: and added several tracts and tables of his own. Various other publications, too numerous to be mentioned, were issued, by that board, during his life, under his inspection.

On him devolved another arduous and rather unpleasant duty, in consequence of his office—unpleasant—for what can be more so, to a well-educated and feeling mind, than to declare to a man that his labours are useless, or inapplicable, over which he has spent many laborious days and nights. It was his business to examine the manifold productions of candidates, who claimed the parliamentary reward for new or improved methods of finding the longitude. Notwithstanding Dr. M.'s impartiality and extensive knowledge of the subject, he was not so fortunate as to satisfy every applicant. The liberal rewards offered, and the powerful motives of honour and emulation, elicited many productions of genius, particularly in the construction of time-keepers. The foregoing considerations likewise incited numerous candidates of very slight pretensions; perhaps, such as Dr. Keill has said, on a similar occasion, scarcely understood the meaning of the term longitude.

In giving a general history of Dr. M.'s labours at the Royal Observatory, it is necessary to begin with the Observations made there, which were printed by order of his Majesty, in 1774. The first volume contains the Observations in 1765. Ever since that time, the Green-

wich Observations have been published annually. M. Lalande, in mentioning this performance, in 1792, calls it "the most valuable collection extant." His Catalogue of the right Ascension and Declination of 36 principal fixed Stars, with tables for their correction, is a most useful and important performance, and adopted in all observatories. M. Delambre, in a paper composed by him, on the life and labours of Dr. Maskelyne, and read before the National Institute, January 4th, 1813, makes the following remark: "He (Dr. M.) has given a catalogue of stars, not numerous; but so accurate, as to have served almost solely for the last 30 years, as the foundation of all astronomical researches. In short, it may be said of the four volumes of Observations, should the science be lost, and this collection only saved, there would be found in it sufficient materials to construct almost an entire edifice of modern astronomy; which cannot be said of any other collection."—Should not a work, thus characterised by an erudite foreigner—the native of a nation at that time at war with us—have a place in every public library in the united kingdoms? And placed by its side, also should stand the Jesuits' edition of the immortal Principia of Newton, to show to the rising generation what our countrymen have done—works, which it has been affirmed, will last "as long as the sun and moon shall endure."—Start not, Mr. Editor, at the name of Jesuit—the popish religion has nothing to do with the work: two learned Jesuits, Le Seur and Jacquier, wrote a large commentary on this—the greatest of human productions.

Dr. M.'s observations of the sun, moon, and planets, are greatly esteemed, and have been made the bases of the solar and lunar tables, computed in France, according to the theory of M. Laplace; and re-published in Professor Vince's Astronomy. The solar tables were calculated by M. De Lambe, and the lunar by M. Burg: copies of which were transmitted to Dr. Maskelyne, by order of the French Board of Longitude, with a grateful acknowledgment of the important assistance derived from his Greenwich Observations. See Professor Vince's Astronomy, volume 3.

To enumerate all the corrections and improvements effected by Dr. M.'s Observations, would occupy more space than can be allotted to the present memoir; but the reader is referred to Professor Vince's Astronomy, and to the Philosophical Transactions.

His communications to the Royal Society, like his other productions, are particularly valuable for their great utility and accuracy. They consist chiefly of astronomical observations; improvements of mathematical and optical instruments; calculations of the eclipses of the sun, moon, and Jupiter's satellites; articles on parallaxes, light, vision, refraction, weight, measures, gravitation, &c.; also calculations and predictions of comets; together making above thirty communications. In 1774, he went to Sheallien, in Perthshire, to ascertain the lateral attraction of that hill. In his account will be seen with what care and trouble this work, which appears so easy, was attended. He found 5, 8" the quantity the line was affected by the attraction of the mountain; thence he concluded that the density of the mountain was the mean density of the earth: the result deduced was, that the density of the earth is greater towards the centre than at the surface, which has been also proved by the measure of degrees, and by the pendulum: in fact, the density of land is four or five times greater than that of water. For this he was presented by the Council of the Royal Society, with Sir George Copley's gold medal.

In the history of science, few persons can be mentioned who have contributed more essentially to the diffusion of astronomical knowledge than Dr. Maskelyne; and perhaps no man has been so successful in promoting practical astronomy, both by land and sea. During his time, private observatories became general, though scarcely known before; nor could such be made useful without his Nautical Almanac, and other tables, except by men of extensive science, and by very laborious calculations.

He was, moreover, an improver, and also an inventor of instruments; among which may be noticed the prismatic micrometer: but though profoundly skilled in optics, and ingenious in mechanical contrivances, he always paid great deference to the opinions of opticians, and other practical mechanists.

His plans were mostly directed to substantial objects, while a steady perseverance gave an efficiency to all his undertakings; and notwithstanding his profound knowledge of physical astronomy, his attention was chiefly directed to reduce the scientific theories of his predecessors to the practical purposes of life. In this he was eminently successful, particularly in his labours for the longitude, by which he essentially contributed to the advancement of navigation, the prosperity of commerce, and the wealth, honour, and power of his country.

Dr. Maskelyne corresponded with all the celebrated astronomers of his time: to be convinced of this, it is sufficient to look over the papers of the learned of all nations, which he has presented to the Royal Society.—He did not write so much as could have been wished: but it is difficult for an astronomer, engaged in constant observations, with the care of the Nautical Almanac, to undertake great theoretical inquiries, in which he would be continually interrupted; he never omitted to make the most difficult and interesting observations himself, as those of the moon; trusting to his assistant only when the observations were more easy and less important. The writings he published, are distinguished by correct and just ideas, and great depth of knowledge: such is his treatise on the Equation of Time, in which he has corrected, with due attention, a mistake which had escaped La Caille, and a smaller error of Lalande.

Lalande took in good part the lesson which was given him; but Bernouilli having seven years afterwards inserted a translation of Dr. Maskelyne's memoirs, in his "*Recueil pour les Astronomes*," one of Lalande's pupils, (d'Agelet) took the part of his master, in a manner that might have caused a coolness between the parties concerned; but it had no effect of that kind, and the two astronomers corresponded as before. Some doubts were entertained respecting the latitude and longitude of Greenwich. Dr. M. to whom the memoir¹ was sent, showed, with his eloquence and usual moderation, that the doubts were without foundation; but he did not oppose the means used by others to remove them.

Dr. M. had good church preferment from his College; and his paternal estates, (of which he was the last male

heir), were also considerable. He married, when rather advanced in life, a young lady of large fortune, the sister and co-heiress of Lady Booth, of Northamptonshire, by whom he had one daughter, whose education he superintended with the fondest care. Dr. M. died on the 9th of February, 1811, in the 79th year of his age; his health previously declining for some months: and he contemplated his approaching dissolution with pious resignation, and with a lively hope of being admitted into the presence of that Deity, whose works he had so long studied, and so ardently admired. His favorite science tended the more strongly to confirm his religious principles; and he died as he had lived, a sincere Christian—an additional proof "*that the knowledge of nature will ever be the firmest bulwark against Atheism; and, consequently, the surest foundation of true religion.*"

Among his most intimate friends, may be classed Dr. Herschel, Dr. Hutton, Messrs. Wollastons, Mr. Aubert, Bishop Horsley, Sir George Shuckburgh, Baron Maseres, Professor Robertson, also Professor Vince, whose publications ably illustrate Dr. M.'s labours; and whom he appointed the depository of his scientific papers.

Thus, from Dr. M.'s important labours, his public character is well known, and his fame immovably established; but the man, the father, the friend, was truly estimable. He was, indeed, exemplary in the discharge of every duty. In his manners, he was modest, simple, and unaffected. To strangers he appeared distant, or rather diffident; but among his friends he was cheerful, unreserved, and occasionally convivial.

Dr. Maskelyne has been succeeded by John Pond, Esq. F. R. S. who was appointed Astronomer Royal, in February, 1812.

Mr. EDITOR,

To read an account of the liberal support which has been afforded to the widows and children of the unfortunate crew of the Whale-ship, supposed to be lost in Davis' Straits, must be gratifying to every philanthropist.—Though it is much to be feared that the crew has perished, yet the following narration renders it barely possible that

some may still survive. I wish not to raise fruitless expectations in the minds of the distressed ; but it may afford a gleam of comfort till Time's lenient hand shall have softened their afflictions.

In 1630, three English ships were fitted out for Greenland. One of them being straitened for provisions, the master sent eight of the crew on shore to kill venison, allowing them a boat, and giving them orders to follow the ship to *Green-Harbour*, situated a little to the Southward of the place where they landed. Having killed 14 or 15 deer, they purposed the next day to return to the ship ; but a great quantity of ice drifting to the shore, obliged the ship to stand so far out to sea as to be out of sight when they reached *Green-Harbour*. Knowing the ships were to rendezvous in *Bell-Sound*, and to leave Greenland within three days, the poor fellows began to be very uneasy lest the ships should depart ere they arrived. They thought it expedient to throw the venison into the sea to lighten the boat, and to steer, with all possible speed, to *Bell-Sound*, about 16 leagues to the Southward ; but all being ignorant of the coast, they overshot the port 10 leagues. When sensible of their error, they returned to the Northward ; but one of the company being positive that *Bell-Sound* lay further to the South, they sailed Southward again, till they were a second time convinced of their mistake : then bore about to the North, and, at length, arrived at *Bell-Sound* ; but so much time had been lost, that the ships had, to their great consternation and distress, left the coast, and sailed for England.— These unfortunate creatures stood gazing on each other, amazed at the distress to which they were so suddenly reduced, being provided with neither food, fuel, clothes, or house, to shield them from the inclemency of so rigorous a climate. Their perplexity being somewhat abated, they began to devise the most proper means to support life during the approaching winter, in a country within 12 leagues of the pole ; being the first that ever did inhabit it the year round : and, perhaps, there is no instance in history, of a company of men, in such exquisite distress, that showed more courage and patience, or made a wiser provision for their preservation. In the *first place*, they agreed to go to *Green-Harbour*, where

they arrived in twelve hours ; and having provided nearly twenty deer, and four bears, returned to *Bell-Sound* ; where fortunately was erected a large booth, for the use of the coopers in the fishing season ; the length of which was 80 feet, and breadth 20, covered with Dutch tiles : within this they built another, whose length was 20 feet, breadth 16, and height 10, so contrived as to admit as little external air as possible. They provided themselves with wood, which they stowed between the beams and roof of the greater booth.

On examining their stock of provisions, they were convinced that it would scarcely serve them half the winter ; therefore, they stinted themselves to a meal each day, agreeing to keep *Wednesdays* and *Fridays* as fast-days, relying on *Heaven* to alleviate their distress ; and redoubled their prayers, for strength and patience to endure the trial.—By the 10th of October, the nights had become long, the weather very cold, and the sea frozen over ; and having no business to divert their gloomy thoughts, they more than ever reflected on their miserable condition ; but they received great consolation from fervent devotion.—Having again surveyed their provisions, they agreed to have each week, three meals of venison and bear, and four of fritters, or greaves, which is very loathsome food, being only the scraps of the fins of whales, thrown away after the oil has been extracted.—Lest they should want fuel to dress their food, they thought it adviseable to roast more at a time, and stow it up in hogsheads. It being now the 14th of October, the sun had left them ; but they had the moon both day and night, though much obscured by clouds and foul weather ; there was also a glimmering kind of day-light, for eight hours, the latter part of October, which shortened progressively till the 1st of December ; from which, till the 20th of the same month, they could perceive no day-light at all, being now one continued night. To procure light within doors, they made three lamps of some sheet lead found upon one of the coolers, and there happened to be oil enough to supply them, left in the cooper's tent ; for wicks, they used rope-yarns.—These lamps were great comfort to them in that long

dismal night; but still their misery was such, that they could not forbear sometimes uttering hasty speeches against the master of the ship who had caused all this distress; sometimes, reflecting on their former ill-spent lives, they considered this as just punishment for their offences. At other times, they hoped they were reserved as a wonderful instance of God's mercy in their deliverance, and fell on their knees two or three times a day, to implore the protection of the Almighty. On the 1st of January, their day began to increase; and with the new year, the cold increased to that degree, that it raised blisters on their flesh, as if they had been burnt; and the iron they touched, stuck to their fingers.

On the 3d of February, they were again cheered with the bright rays of the sun, which shone upon the tops of the snowy mountains, and afforded them the most delightful scene that was ever beheld, after a night of so many weeks.—As an addition to their joy, the bears began again to appear, one of which they killed at their door; but the cold being intense, they dragged the beast into the tent, to cut it to pieces, on which they fed twenty days.—After this time, numbers of bears came about their booth, of which they killed seven, and roasted their flesh; by eating heartily two or three meals a day, they found their strength rapidly increase.

It being now the 16th of March, and the days much longer, the fowls, which in winter time fled to the Southward, began to return to *Greenland*, in great numbers; the foxes also, which had remained in their holes under the rocks all the winter, re-appeared.—Of those they took fifty, and roasting them, found them good food. Being now the month of May, the weather grew warm; and the season for the arrival of the shipping coming on, they went daily to the top of a mountain, to see if they could discern any ships. On the 25th of this month, one of them being in the outward booth, heard somebody hail the tent: to which he answered in seaman's terms; they were just then going to prayers, and staid but for the companion in the other tent to join them. The man who hailed them, was one of a boat's crew just come from England; whom the rest within no sooner heard, than they ran to meet their countrymen with transports of joy that cannot be expressed.

One of the ships which now arrived, was commanded by the same master that left these poor men on shore ; and he, barbarous brute ! to excuse his own inhumanity, began to revile and curse them, calling them ROGUES and RUN-AWAYS.—But notwithstanding the barbarity of their own captain, the commanders and officers of the other ships took care they should be kindly used, and brought to England, where they were provided for by the bounty of the generous and humane merchants.

I am, Sir, yours, respectfully,

WILLIAM HARRISON.

Burton-Pidsea, October 18th, 1814.

ON THE PROPRIETY OF CORN LAWS.

AT the present moment, when the policy of Corn Laws engages the serious attention of the Legislature, and the nation is not without alarm, lest the measures they may find it necessary to adopt, should give rise to popular commotion ; the reasons in their favour cannot be too widely circulated. To give a simple statement of them, after so much has been said and written on the subject, is a task wherein novelty cannot be expected. The writer of this article wishes only to be useful. Many may read this paper, into whose hands the able pamphlets on the Corn Laws may never come.

And first of all, it is important to ascertain what the question is not, before we state what it is. We find many eager in their opposition to the Corn Laws, because a free trade, say they, is at all times to be preferred to one that is subject to restrictions ; an abstract principle perfectly correct, but by no means the present question. The very opposite position, namely, that trade should be subject to regulations, is the policy of Europe, and, in an especial manner, the policy of Britain. Almost all other kinds of industry are and have been protected by the Legislature ; and the question is, whether the same kindness ought or ought not to be extended to the Agricultural.—More-

polies have been, at various periods, granted to the merchant, that he might reap undisturbed, for a reasonable time at least, the harvest of his daring speculations. Bounties, too, have often times increased his gains. Many towns have privileges secured to them by charter, which are calculated to increase the profits of certain kinds of labour, as well by preventing competition, as by excluding from such employments an undue number of hands. Of this Sheffield and Norwich are examples. A hat-maker is in this manner protected throughout the kingdom. Lace, silk, and watches may not be imported, so that the manufacturers of these articles are blessed with a monopoly ; and, as the farmer is not allowed to export his wool, the woollen-manufacturer pays him just what price he pleases. 'So completely, indeed, has the landed interest been duped by the interested cry of the exporting manufacturer, that commerce is the heart-blood of our system, the very essence of our prosperity, and of every part of our commerce the woollen manufacture the most important ; that they have consented to give out of their own pockets, annually to these manufacturers, from two to three millions sterling ; an amount sometimes greater than the whole amount of our export of woollen cloths.'* Such being the condition of the merchant and manufacturer, it is but common justice to place the farmer on an equal footing, to afford him similar protections, if he cannot do without them.

The price of wheat, says the evidence, on which is founded the Report of the Committee of the House of Commons, should be between 80 and 90 shillings, say 84, the quarter, to afford a reasonable recompence to the farmer for his risk of capital and labour. Of this 84 shillings, $\frac{1}{4}$ d goes in the form of rent, another in expences ; the whole cost, therefore, of the cultivation, is 56 shillings. But as wheat can be imported from the Baltic at the rate of 50 shillings, instead of clearing 26 by every quarter which his farm produces, the farmer is minus six shillings ; that is, he is ruined. Another mode of reasoning also proves the necessity of wheat being about the price which is stated in the report of the committee. The expences of

* *Spence's Britain Independent of Commerce*, p. 66.

a farm are taxes, poor-rates, the cost of cultivation, tithes, and rents; all of which have been doubled, and more than doubled, within the last twenty years: and as the value of all the articles of domestic use and comfort has risen in the same proportion, to cultivate his farm, pay his taxes, tithes, and rents, and live with comfort, the farmer ought to sell his produce at least for twice the sum he obtained for it twenty years ago. In 1794, wheat was 47 shillings the quarter; the present estimate of the committee is, therefore, 10 shillings less than he has a right to claim. Here I expect a whole army of objections.—1st. It is said, 'Taxes will be taken off.' The proof of this rests with the objector. To us, when we consider the present increased expenditure of Government, the present war with America, and the necessity of sending out expensive expeditions, to humble that haughty people; when we add to these the National Debt, about 600 millions, the interest of which must be annually paid, and the principal diminished; the reduction of our taxes is as yet below the horizon of our wishes. 2ndly. 'Poor-rates will be less burthensome.' They are just now, from the cheapness of provisions, less oppressive than they have been for some years; but if a death-blow be given to our agriculture, every village will be a work-house, and every inhabitant a pauper. 3rdly. 'The expences of cultivation will be lessened.' These include materials and wages. Of the former we have said the price is more than doubled; and as this is owing to the great increase of population, taxation, and accumulation of the national debt; money will never reach its former value, and never can approach it, till taxation ceases, and the debt is paid; events sufficiently improbable. The idea that wages will be lower, arises from an opinion very common, that they are altogether regulated by the price of food. It is true, they rise with the increasing prices of provisions, but other causes keep them up, when these high prices exist no longer; the principal of which is this very cheapness. Corn very cheap checks agricultural exertions, and creates a surplus number of labourers; a reason which, by the way, one would suppose able to effect a reduction of the wages of

labour. But this cheapness, in proportion as it deadens agriculture, quickens the efforts of the manufacturer. He adds to the number of his hands, and no more labourers are left than are demanded by the farmer; there is now no competition, no surplus number of hands, and the rate of wages is unaltered. It is true that, until this transfer is effected, there is a small reduction, but it is only temporary. This theory is confirmed by all the experience we have had. 4thly, and lastly, 'Rents and tithes surely must fall.' Like wages, these advance with the increasing prices of the comforts and luxuries of life; but so long as those causes operate, which have doubled and trebled the cost of every thing, so long ought rents and tithes to maintain their present altitude. It is true they must be ultimately lowered: necessity will cause their abatement; but this necessity is the ruin of the present race of farmers. And suppose £d to be taken off, the cost of cultivation would be almost equal to the price of imported grain, and the profit of the farmer insignificant indeed.

Such are the reasons the farmer may urge very justly in favour of the Corn Laws. Others yet remain of a more selfish cast indeed, as regards the manufacturer; he also, though he is unwilling to believe it, would be benefited by the price of grain being kept high enough to remunerate the farmer.

1. Having we trust proved, to the satisfaction of our readers, that without some protection our agriculture will be ruined; the independence of our country is at an end, and our supplies must all come from foreign markets: a system certainly unsafe. In case of the failure of the crops in the North of Europe, our principal resource, the scarcity will very suddenly and very fearfully raise the price of grain; an evil which has always been attended with the utmost distress to the lower classes, and which our independence secures us from altogether. Nay, so steady would be the prices, if we grew the greatest portion of our grain, that scarcity, by making room for importations, would not affect them. Besides, another despot, or a combination of the tyrants of the continent, will be enabled, by their commercial regulations, to curse us with a famine. We are left to the mercy of a set of men, who hate us for our greatness; and, to rob us of our maritime superiority,

would risk their own independence. Communities act in general from interest ; tyrants often from caprice. The Berlin and Milan decrees should never be forgotten. Poland, moreover, is about to be an independent kingdom ; a good Government will ameliorate the condition of its people ; and we are confident every Englishman wishes the Pole to eat wheaten bread, instead of a black unwholesome mixture of rye and barley. A middle class, if manufacturers are introduced, will have the same effect in Russia. The boor, throwing aside his present loathsome crusts, consumes the very grain, he now cultivates for others to enjoy.

2. Agriculture is at present a great source of our revenue. The produce of this country, before it passes from the grower to the manufacturer, to constitute his wealth, and to be taxed as often as it is transferred, pays a tax of 10 per cent. The ruin of our agriculture must, therefore, cause a serious defalcation. The foreign grower pays no tax for imported produce, and the failure must consequently be made up by an additional tax levied upon the manufacturer. It may be said, the increase of our manufactures, owing to the cheapness of food, will more than balance this. When we consider, that of the twelve millions of the inhabitants of this country, $\frac{1}{3}$ th is employed in agriculture, the custom of which the manufacturer must lose ; and, as we shall shew, that our foreign commerce is not likely to continue, this idea of the increased prosperity of our manufacturers is a delusion.

But here we have to encounter an apparently formidable objection, almost the only argument, indeed, the manufacturer is able to send forth to oppose the Corn Laws.—If grain, it is said, be higher in this country than on the continent, the manufacturers established there will be able to under-sell us in the foreign market, to the entire ruin of our foreign commerce ; the source of all our wealth and greatness. We will strip this Goliah of his armour, and shew him in his really unappalling stature. Every article of food is so much cheaper on the continent, than it ever can be in this country, while taxation and the necessity for it exist, that even our superior skill, and improved machinery, will stand us in little stead in the

foreign market ; and whether we have or have not laws to keep up the price of grain, we must be content to see our commerce leave us, to flow in other channels. So far the objection is entirely nugatory. This destruction, however, of our commerce is not so serious an evil as is commonly imagined ; that it is the source of all our wealth and greatness, is a delusion which Mr. Spence had the honour most effectually to expose, and whose reasonings have hitherto been combated only by the idlest sophisms. If our external commerce had been essential to us, the operation of the Berlin and Milan decrees, and non-importation act, must have been our ruin ; instead of that, though a few towns were injured, the national income and taxes were never greater. And on the comparative value of our external and internal commerce, we will present our readers with an abstract of the statements of the Quarterly Reviewers. The value of British produce and manufactures, annually exported, has increased pretty steadily from 40 to 45 millions, the last ten years, except in 1809, when the operation of the Berlin and Milan decrees prevented exportation. This, however, is a mere trifle, when compared with our internal commerce. When every pauper in a parish work-house costs £15 per annum, it is no exaggerated estimate, to reckon the average expence of each individual in Britain £20. The whole population is about 12 millions ; so that the aggregate expenditure is 240 millions sterling. It may be said, that of this 240 millions, 15 or 20 are paid for imported foreign produce, but this is balanced by the domestic commerce of Ireland, which cannot be valued at less than 20, and is really 30 millions sterling. Our domestic consumers, therefore, purchasing to the amount of 240 millions, and our foreign ones 45 millions, is a proof that our outward commerce, however important, adds no more than a 5th or 6th part, ($\frac{1}{5}$,) to our commercial prosperity ; and the greater portion of this trade being carried on with our foreign possessions, and with Ireland, leaves $\frac{1}{4}$ part of our commercial prosperity, to be derived from customers over whom we have no control.

Beverley, September 15th, 1814.

AGRICOLA.

ON APPARITIONS.

As the winter is a season in which the fear of Apparitions is most strongly impressed on the minds of the weak and superstitious, it may not be amiss to offer a few cursory remarks on this important subject. Important it must be, for any thing, however trifling in its nature, becomes important when it affects the interests or happiness of our fellow-creatures; and I believe there is no subject whatever, (save Religion,) which possesses a stronger claim to both those titles, than that now under discussion. When we reflect on the fear and disorder it occasions in the world, a great proportion of whose inhabitants is its slaves, we cannot help acknowledging it is of the *highest* importance. So deeply is it rooted in the minds of millions, that it is the predominant passion in their breasts, and lords it over their reason and better judgment with absolute sway.

When we further reflect on the manner in which this persuasion is originally planted in the mind, we shall not find it a matter of surprise, that its votaries are so numerous. It is an evil which calls loudly for redress, as well from the parent as the philosopher. No sooner are children capable of distinguishing one object from another, and of having ideas conveyed by words, than it is the common practice of nurses to alarm them, for the most trivial fault or the least peevishness, with the dreadful name of a "Sweep," an "Old Man," or a "Bogle-bo." Children, at this period of their lives, naturally believe all they are told, being unconscious of falsehood. What a lamentable thing it is, therefore, that the first seeds which are sown in the breasts of mankind, are those of terror and superstition—two passions which directly tend to form a race of cowards; and these seeds it becomes the business of every one to nourish and support, till the root has become too deep to be eradicated.

Should threats prove ineffectual, as is seldom the case, recourse is had to another and still more dangerous expedient; and that is, to engage some one to appear in disguise from behind a curtain: If there be any shadow of doubt or courage remaining, it is put to flight; their *tender minds are now completely enslaved, inasmuch as*

they have the additional testimony of their other senses to countenance the delusion, and render it "confirmation strong as proofs of holy writ." The experiments being often repeated, and children are unable to see through the artifice, it is almost death to them to be left alone in the dark ; and hence is one great reason why they are, in general, unwilling to go to bed. This cannot be too carefully guarded against, as it is productive of the worst of consequences ; 'tis the rudiments of weakness, the groundwork of fear, and the foundation of a life-existing alarm. Far more beneficial !—far more merciful—would be the rod of gentle correction ! Nay, an almost intolerable beating would be preferable to this mistaken method of reducing them to obedience.

In the course of a few years, it is true, they rise above the fear of a sweep or beggar, and can behold either without abhorrence; yet the principle still remains, and is only transferred to fresh objects. They are now sent to school, and this is but a change of scene, not of subject, for here fresh trials await them: their companions and school-fellows (being in the same situation, with very few exceptions,) are so constantly repeating tales of this nature, to each other, that it is difficult to determine which is the boldest. Thus, with fear firmly rooted in their minds, their belief gathers additional strength from every instance, and it rarely happens that the dreadful ideas dependent on such a belief ever leave them ; they "grow with their growth, and strengthen with their strength :" and any idea of their eradication is almost irrevocably excluded by the constant succession of tales they are in the habit of hearing.

But it is not to childhood that we must look alone for it; manhood, alas ! partakes of it, if possible, in a greater degree. Woeful perversion of reason ! terrible infatuation of mind which tends to bring the lordly powers of man, if not below, at least to a level with, the standard of brutality !

It is found in the cradle, and only lost in the grave; and the longer a man lives, the more he hears or sees ; and, consequently, has more to relate. There is a kind of melancholy pleasure in telling these tales, with the addition of an insatiable curiosity in those that hear : any *thing romantic* is generally well received ; and tales of

apparitions are doubly entertaining, from their being implicitly believed—so implicitly indeed, that hardly any subject, however aggravated, is too much out of nature to have credit given to it,—the imagination as it were, expanding itself, according to the object described. Tell a person of this stamp, that in such a place, at midnight, you have beheld a headless trunk, clad in a bloody vesture, and heard it utter the most dismal groans—you run no risk of detection—your word will be taken, and your story circulated as a fact; 'tis five hundred* to one that any dare examine, at midnight, whether it be so or not. Goldsmith says, that "if the people flock to see a miracle, it is ten to one but they do see a miracle," and this will hold good with respect to apparitions. Set a village circle round the blazing hearth, and say that as you came in you heard a rattling of chains, and instantly all is still—every eye is fixed—every mouth is open—bye and bye this same supernatural clanking is heard by every one in the company—the doors are fastened, and every chair drawn nearer the fire, while their terrified burthens look wildly at each other in breathless expectation. When the alarm has in a small degree subsided, the silence is broken by some one in company who begins an hair-erecting tale of a murdered pedlar. No sooner has he closed the dreadful narration, than another produces a similar one, and thus alarming tales go round the circle. Ere the company disperse, the imagination of every one is wrought to such a pitch, that he scarcely dares venture home. Should he be so fortunate as to reach his abode without seeing something which would have been better unseen, and the odds are much against it, he immediately proceeds to bed, wraps himself over head in the clothes, and is only relieved from his perilous situation by the god of sleep.—Happy were it if it ended here, but it frequently pursues him further; his slumbers are broken in upon by the most terrifying dreams, and he starts from his couch in an agony: not knowing what resource to fly to, he seeks his bottle, and strives to drown his cares with its intoxicating contents, by frequent repetitions of which, he often reaches his grave in an untimely hour.

* The suppositious population of a tolerably large country village.

The most courageous or scientific of men are frequently slaves to this degrading apprehension, and are unable, with all their courage or philosophy, to shake it off.

Where Superstition drags her heavy chain,

Farewell

“Love, Hope, and Joy, fair pleasure’s smiling train—

Welcome

Doubt,* Fear, and Grief, the family of pain.”

Having already gone to a greater length than the limits of your pages will well allow, and much remaining yet unsaid, I shall trouble you, in your next number, with a few more observations on this important and interesting subject, if these already offered be honoured with an insertion, as I flatter myself they may really be of service to the public.

LITERARIUS.

Bridlington, October 8th, 1814.

* The shade of POPE will pardon me for substituting “doubt” for “hate,” as it is better for my purpose, though it injures the couplet.

SIR,

WHILST I encounter your New Subscriber, I shall not, as a hawk, pursue him through his aerial passage over the subject; but rather imitate the manner of fishes, and catch him when he dips.

The question connected with Necker’s Imperious Necessity, vol. 2, pa. 17, is of small importance, as strong reasons are not necessary to persuade a man of business to adopt any measure which will add five per cent. per ann. to his capital. This seems to have been precisely the case with the Directors of the Bank, at the time alluded to: receipts of cash were continued; but the payments were diverted into another, though not less profitable channel. Paper issued from the Bank on the same conditions as guineas, ten in lieu of five, flowed into the hands of the proprietors—absolute and imperious necessity on the part of the nation, became a source of gain to the Bank. The complaints of the people were checked by the idea, that Government

held specie sufficient to indemnify them for the credit given to the Bank by the use of its paper; it being admitted by all parties that ready money is the best security.

This gentleman seems to have taken such a view of our circulating medium, as he might have done of a paper-mill, which consists of an elliptic trench, filled with water and rags; in one side of which is fixed a pair of grinders, through which the water and rags pass together, keeping the contents of the trench in a circumfluent motion. If this machine is viewed from a given point, the person so viewing it, might be led to suppose, from the rapidity with which it issues from the grinders; "and having no other channel into which it could run, has, like the plenteousness of any other commodity, made it cheap; or, in other words, depreciated it;"—but on a more extensive survey of the mill, it would be manifest, that the rags, like our paper circulating medium, only run out to run in; and run in to run out.

In the above quotation from your New Subscriber, is an axiom in trade—invariable in its operation; but not universal in application: the word plenteousness being opposed to scarcity, not any commodity is subject to its varying influence, but such as are liable to both; as is corn, whale-oil, or any other article with which we are only furnished at stated periods; the quantity depending on the productiveness of the seasons; which is not the case with a paper circulating medium, there not being any thing in the manufactory of Bank notes to excite an apprehension of their being scarce. Some people speak of paper money as they would of butter or eggs, when in the act of bargaining for them. If the idea be carried a little farther, we shall not be surprised to hear of people taking waggon-loads of money to the market, and returning with the cheap-purchased commodities in their pocket-books.—The circulating medium, (considered merely such) is as distinct from property, as a wheel-barrow is from the stuff you convey in it; and a man would not exhibit a greater manifestation of the want of common sense, by

returning with the rubbish in his apron, and leaving the barrow behind him, than he who confounds the one with the other. It is something in exchange, for which any other may be obtained. If taken in any other view, it is mere lumber. Nearly allied to this distinction, is one known to Theologists by the appellation of *letter* and *spirit*. The difficulty of describing it as a thing separate from the value of the materials of which it is composed, arises from its having no parallel: there is not any kind of property as distinguished from the circulating medium, but must be converted into it before every other thing can be obtained for it. This idea may be illustrated, by supposing the case of a man, whose little farm produces milk only, which he exchanges for a part of the circulating medium, by means of which, he may obtain as many different articles as he may want. As not any advantage can be derived from the circulating medium, but as a means of conveying property from the possession of one to another, (the rate of conveyance being the same), it is immaterial whether it be by paper or gold.

Remembering what I had read in the *prospectus* of your work, my reluctance to introduce bare-faced politics so far prevailed, as to prevent me from being sufficiently explicit; but your New Subscriber asking, in such a peremptory tone, what I mean by the words "in support of a public measure," I will cast off the veil, and ingenuously inform him, that the whole of the sentence with which the words are connected, is an allusion to the Corn Bill. The depreciation of our paper money having been brought, by the principal mover, as an argument in support of that "public measure." The New Subscriber appears to be undecided, when he says, "from this time, but I may be wrong, I suppose that paper money began to depreciate."—Perhaps it is difficult to say exactly, how much, in this country, the pound note has depreciated.—Sir H. Parnell contended for the necessity of restrictive regulations in the importation of corn, for the avowed purpose of screening the landed interest from the evil of a depreciated currency; and Dr. A. in a public oration, opposed that measure, on the same ground that its *advocates* defended it.

If indecision, or the adoption of opposite measures to counteract the baneful influence of a supposed evil can be admitted as proofs that it has not any existence out of the imagination, the above quotation will warrant the conclusion, that the evil of a depreciated circulating medium is purely ideal.

I have it from an authority, which scarcely admits of a doubt, that were we to send Bank notes, or as he terms them, "this sort of stuff" to the continent, the good folks there would send us in return, good wheat at 36s. per quarter; it must (to use his own words) then indeed, so long as Government exists, be all a farce about our paper money having depreciated.

He seems to sympathize with the stock-holders, whilst they, poor simpletons, go on buying and selling, as if nothing was the matter—not knowing that there is any place in the world where their property can be more secure. I would advise him to leave these gentlemen to the management of their own affairs; some of them, at least, know as much about the security of funded property, as either of us.

If I lament as much as he can do, the enormity of the National Debt, and the causes which produced it; but he must excuse me, if I refuse to go any farther with him.—My limits not allowing me to enter minutely into this subject, I must content myself with remarking, in general terms, on what is deducible from his writing, that the only advantage that the contractors of the debt have derived from a paper circulating medium, has been in the anticipation of property for a few months—property being the thing of which the debt is composed; and that the circulating medium is only the means of conveying it; and had that medium been gold, (admitting it to have been as plentiful as on former occasions,) it would not have furnished any obstacle to the increase of the national debt.

To his "jogging on in the old fashioned way," I have no objections, should he even adopt the customs that were in use in my grandmother's time, and "boil his tea by the pound together, and strain off the water, and eat only the leaves buttered as we do cabbage," he has my consent;

but not that "our improvements should be fewer." If he mean to class our improvements with the advantages of a paper over a metallic currency, it is a concession, which will furnish an argument for

Your obliged servant,

LEX.

To the Editor of the QUARTERLY VISITOR.

SIR,

HAVING read your edifying Miscellany with great profit and pleasure, and having also perceived how charitably you are disposed to the miserable and distressed, I beg leave to exhibit my case before you and your ingenious readers, that, by the advice which may be afforded me, I may act with prudence and wisdom.

I am the daughter of a wealthy merchant, who is beloved and respected through the large circle of his friends and acquaintance; and, indeed, he obtains this treatment deservedly and meritoriously; but I have a mother, who, notwithstanding her good principles and honest heart, has taken an aversion to Bookish Ladies.—She was the daughter of a country 'Squire, and has been taught that to cook a goose or turkey, with skill and nicety; to dexterously carve for the hunting parties of her husband; to bake puddings, pies, and custards, without burning their crusts, are the neatest accomplishments a female can possess.

She also thinks that females ought to spend their time more profitably than in reading; and inveighs against the present system of female education.

I was sent to a boarding-school at some distance from home, merely as a matter of form, and where I imbibed a taste for reading voyages, travels, novels, &c. and especially the latter.

To enter into a description of what I learnt at boarding-school, would be insipid and useless; but, however, my father thought me much improved, and my mother much degenerated.

On my return home, I entered upon a different scene from what I beheld at school: to attend to the simmering of the sauce-pan, and the various preparations

of utility and ornament, was here reckoned one of the greatest objects of importance. If my mother perceives me reading, she will hint "that novel-readers never make good wives;" if she sees me writing, she will affirm that I had better be darning stockings, than inking my fingers and wasting my time in such an unprofitable manner.

Dear Mr. Visitor, tell me what I must do; assist me with your advice, and inform me by your counsel; and you will ever be remembered by yours, faithfully,

September 7th, 1814.

PUELLA.

Poetry.

ON A WITHERED LEAF.

Poor leaf, how alter'd is thy form,
The passive sport of ev'ry storm,
All shriv'ling in decay!
Methinks the Miser looks like thee;
Him have the frosts of penury
Stripp'd from society's fair tree,
Of wretchedness the prey.

Who fashion'd this despised leaf,
His finger form'd the man of grief,
The creature of his pow'r;
Shall then the tear of sympathy
On thee distil, nor fill my eye,
That he a very wreck should lie,
On life's deserted shore?

How wretched she, ah! how forlorn
In age, whom in life's hopeful morn,
Temptation led astray!
I mark'd the false capricious breeze,
With gentle whisper stir the trees,
Anon its yielding victim seize,
And bear the leaf away.

Poor leaf, how transient was thy bloom !
 One summer fled, and o'er thy tomb
 The winds of autumn sigh'd ;
 Sad emblem of all mortal things !
 O'er cities, empires, heroes, kings,
 An evanescent splendor flings,
 He who dethrones their pride.

Beverley, November 4th, 1814.

RUSTICUS.

TO HAPPINESS.

COME Happiness, come welcome guest,
 And lead me to thy dwelling ;
 Fain would I clasp thee to my breast,
 Thy charms are so excelling.

Long have I diligently sought
 To find out thy existence ;
 And oft, unwearied, peaceful thought,
 Has view'd thee at a distance.

With fond delight I then presum'd
 To think I'd really found thee,
 Where amaranths and myrtles bloom'd
 And shed their odours round me.

But soon, alas ! a dark'ning veil,
 Ere yet my thoughts were certain,
 Began to shroud th' ambrosial vale,
 With nature's sablest curtain.

Thus when the heart-consoling scene
 I view, and wish to gain it,
 Some disappointments intervene,
 Before I can attain it.

Well then, sweet Goddess, since 'tis vain
 To approach thy habitation ;
 I'll calmly bear th' allotted pain,
 Of nature's frail creation.

For wise experience has told,
 Contentment is a treasure
 More grateful than huge chests of gold,
 Tho' hoarded above measure :

And he who ne'er repines at fate,
 But counts the thorns as roses,
 Tastes all he can that happy state,
 Omnipotence disposes;

'Till the immortal spirit flies
 To realms of bliss untainted,
 And joins the hosts above the skies,
 Where perfect love is planted.

Reading, Oct. 5th.

JOHN BAINES, Jun.

THE
HULL FEMALE PENITENTIARY.

INSCRIBED TO THE PATRONS OF THAT INSTITUTION.

AH ! tell me where christians delight,
 To check the fell progress of sin ;
 And, from the dark sorrows of night,
 To draw the poor fugitive in.
 Tis a *refuge*, much needed, alas !
 The **HULL PENITENTIARY** forms ;
 To shield an unfortunate class
 From the rage of unparalleled storms.

Ye Patrons ! permit me to praise
 What commands both applause and esteem ;
 Where virtue her vigils displays,
 The daughters of woe to redeem.
 Ah me ! what seductions prevail
 From th' allurements, the baseness of man ;
 For the fiends, who the guiltless assail,
 Are the worst of the reprobate clan.

Go thither, ye wretched, and find
 Relief to the penitent soul :
 Too long, thro' your follies, inclin'd
 To drink of the infamous bowl.
 Too long have ye revell'd in vice,
 And wasted the day-beam of youth,
 Regardless of friendly advice,
 And all the persuasions of truth.

You yet are allow'd to withdraw ;
 From the wantons of Babylon fly ;
 With humiliation and awe,
 To reflection and reason apply.
 Religion implores your return,
 By the counsels of wisdom and peace ;
 And the hearts of the virtuous burn,
 To behold you accept your release.

O ! let not your partners in shame,
 Entice you still heedless to live ;
 Nor fear to encounter their blame,
 For God will applaud and forgive.
 And joy shall in Heaven appear,
 When sinners repentance embrace ;
 To wipe from your eyelid the tear,
 And deck with new beauties each face.

No treasure your joy shall exceed,
 When from the dark vortex you've fled ;
 And conscience, approving the deed,
 Shall point where rich glories are spread.
 Delightful reverse, when each day
 Some pleasing tuition shall bring ;
 Whilst grateful fresh homage you pay,
 And cheerful each matin you sing.

From Mary, the pious and good,
 This lesson of wisdom adore ;
 (Escaped from the Stygian flood),
 Be sober, and trespass no more.
 For nothing on earth can excel
 The Female with chastity clad ;
 It the threats of the spoiler shall quell,
 And the heart of the guiltless make glad.

May Heaven preserve from each snare,
 The weakness of innocent youth,
 And guide them, by virtue and pray'r,
 To the fountain of goodness and truth.
 For there may the weary recline
 On the rock that vain scoffers defy,
 The hope that our thoughts shall refine,
 And waft the blest spirit on high.

Answers to Queries.

(37) *Answered by Mr. PUTSEY, Pickering.*

WHEN we speak of a few, we allude to a small or inconsiderable number; hence, as the adjective *few* is synonymous with another adjective and a substantive in the singular number, the article *a* may very properly be said to refer to that noun to which the latter adjective belongs. The second example in the query is ungrammatical, and therefore requires no comment: the verb *are* ought to be *is*.

The same by GRAMMATICA, Hull.

If the article *a* implies *one*, as I believe every grammarian will allow, then must the sentence "there are a number," be erroneous. Can any grammatical ear bear, unshocked, the sound of "there are one number?" I think not. Hence, it is evident, that every noun immediately preceded by *a* conveys an idea of singularity.

Also by *Messrs. Baines, Harrison, Lamplugh, and Yorke.*

(38) *Answered by Mr. WATERLAND, Thealby.*

WHEN water is poured upon tar or pitch, in a boiling state, it no sooner penetrates the surface, than it is, by the excessive heat of the boiling fluid, converted into vapour; this requiring so much more space than the water, forces the fluid over the sides of the vessel, into the fire upon which it is boiling; and thus sets it on fire. But sand being applied, which is very porous, suffers the vapour to pass through it, without any violence; and extinguishes the burning matter, by preventing it from obtaining a supply of oxygen from the air.

The same by Mr. BAINES, Jun. Reading.

IT is very probable that the heat of the boiling tar sets fire to the hydrogen gas contained in the water, and thereby communicates flame to a substance, which is well known to be very combustible; but when sand is applied to it, it is immediately stopped, by preventing the air from having access to it, without which nothing can burn.

An ingenious answer was also received from *Mr. Osmond, of Withernsea.*

(39). *Answered by Mr. YORKE, Guisbrough.*

To *fetter* implies to bind with chains, to shackle; and is usually applied to the condition of criminals, under confinement: whereas to *tie* signifies to bind or fasten any thing with linen, hempen, or other cords:—hence I conclude that the terms are not synonymous.

The same by Mr. WATERLAND.

The word *fetter* seems to be a particular term applicable only to animated beings, as to put chains on the feet of malefactors, &c.; whereas *tie* seems to be a general term, applied to any thing indiscriminately: from which I conclude they are not synonymous terms.

In a similar manner was this query answered by
Mr. Baines, Jun.

(40). *Answered by Mr. BAINES, Jun.*

IT is well known that sound is propagated in every direction by the vibration of the particles of the air; but if any obstacle prevents the direct movement of the elastic globules, it rebounds in a contrary direction, and strikes the ear with a repetition of the same sound, provided the original sound does not affect that organ at the same instant. This is the case with thunder, which is excited among clouds hanging over each other, the agitated air passing irregularly between them, causing echoes and a rumbling noise, which makes it seem as if it passed through arches and galleries.

(41). *Answered by Mr. ENGLAND.*

THE subject of this query has engaged the attention of several naturalists, each of which has a different system: Some think those apparent shells, &c. are real stones and stone plants formed after the manner of other figured stones; others suppose they were left at the subsiding of the waters of the deluge; and others oppose this opinion, asserting that they could never be carried to the tops of high mountains, on account of their weight; but imagine that the waters of the deluge, intermixed with the salt waters of the sea, upon the surface of the earth, might occasion the production of shells of various kinds in dif-

ferent climates ; and that the universal saltiness of water was the real cause of their resemblance to sea shells, as the lakes formed daily, by the retention of rain or spring water, produce different kinds.

During the lapse of so many centuries, various causes may have contributed to the appearance in question ; for, exclusive of floods or inundations, tempests, &c. which have probably happened in various parts of the world, volcanoes and earthquakes may have raised up mountains in the midst of the ocean, stopped the course of rivers, disjoined continents, and made the waters of the ocean roll over tracts of countries which had been previously occupied by luxuriant vegetation. A late writer has endeavoured to show, that the changes on the earth's surface, and the consequent phenomena of the strata, and the fossil remains, are referable to certain known motions of the earth as a planet. And that sometime between the years 8207 and 15,184 our Northern hemisphere will be covered with water, and the Southern hemisphere will become dry land. See Boston Enquirer, vol. 3, pa. 63, and Monthly Magazine, vol. 33, pa. 118.

The same by Mr. YORKE, Guisbrough.

It seems to be the universal concurrence of philosophers, that the whole face of the globe was once covered with water. Admitting this postulatum, it will be an easy matter to account for the irregularities on the surface of the earth ; and the various fossil substances found in its bowels. At that period, the continued agitation of the waters, and, at times, the tempestuous state of the sea, both contributed a little ; but the setting of currents has been the principal cause of our present diversified scenes of nature, and the various fossil productions in the bottom of the earth. All the bottom of the sea, near the direction of the current, has been drained of its shells ; and, by the force thereof, collected into one heap, and the whole afterwards covered with layers of sand, gravel, &c. &c.— After the subsiding of the waters, the places, in process of time, acquired a coat of vegetable mould.

The Rev. T. P. IRVIN is of opinion, that as marbles, stones, chalks, clay, sand, and almost all terrestrial bodies, wherever they are found, are composed of shells and other

substances, the productions of the sea; that the sea and earth have alternately changed places; and that the present dry land was formerly covered by the sea.

He moreover observes, that shells, and other marine productions, are found not only in gravel pits, but are incorporated in marble and rocks of the highest mountains. He adduces many instances to prove, that the sea successively takes place of the earth, and forsakes its own dominions; and is the cause of these petrified shells being in rocks and marble; as a deluge of 150 days could not have accomplished these things. Yet he acknowledges that we can but very imperfectly judge of the succession of natural revolutions; that we can still less judge of the cause of accidents, changes, and alterations—that the defect of historical monuments deprives us of the knowledge of particular facts, and that experience and time are deficient.

This query was also answered by *Messrs. Baines, Osmond, and Waterland.*

(42) *Answered by Mr. YORKE, Guisbrough.*

ALL fermented liquors are known to produce carbonic acid gas abundantly, and it is from this that they derive their intoxicating quality.

Answered, in a similar manner, by *Mr. Baines.*

(43) *Answered by the Rev. T. P. IRVIN, Cambridge.*

IF we examine those bodies, which, by their mixture, produce cold, we shall perceive, that water existing in a solid state, in one substance at least, becomes fluid, which causes the mixture to absorb caloric; water requiring much more caloric to preserve its fluid state, than it can possess when solid.

The same by Mr. WATERLAND.

WHEN some substances are mixed, the compound has a stronger affinity for caloric than any of its ingredients; and, consequently, produces cold in any body which comes within the sphere of its action, by attracting its caloric from it.

(44) *To this query no satisfactory answer has yet been received.*

(45) *Answered by Mr. BAINES, Jun.*

IDEAS are undoubtedly innate. The faculty of thinking, which we must allow, can be greatly improved by cultivation, is originally a natural gift. To prove this, we need only notice those blockheads, who, having the advantages of time, wealth, and the best masters, do not acquire ideas worth crossing a street for, in the course of a long and tedious education.

Grammatical and Philosophical Queries.

(46) *By Mr. BENJAMIN FARROW, Hull.*

Is light moveable, or eternally fixed?

(47) *By Mr. BAINES, Jun. Reading.*

How can the light emitted by the glow-worm, in the dark, be accounted for?

(48) *By Mr. HUDSON, Epworth, Lincolnshire.*

If a candle be blown out, it emits a very disagreeable smell: query the cause, as the candle has no smell when burning.

(49) *By Mr. PUTSEY, Pickering.*

I HAVE some potatoes, the skins of which, before they are boiled, are red; but, after undergoing this operation, they become white. What reason can be assigned for this curious change?

(50) *By Mr. LAMPLUGH, Walkington.*

REQUIRED the origin of the well-known phrase "*panic fear*."

(51) *By A. B. C. Sheffield.*

THE expression "*unqualified approbation*," has become very general: what is the meaning of *unqualified*?

(52) *By Mr. DERBY, Leeds.*

I HAVE often observed, in narrow lanes, cobwebs, or ropes, extended from one fence to another, three or some-

times seven feet above the ground. How is this to be accounted for?

(53) *By the Rev. T. P. IRVIN, Cambridge.*

If red lead be fused with five or six times its weight of pot-ash, part of the oxide is reduced to a metallic state: query the cause.

Answers to Mathematical Problems.

(72) *Answered by Messrs. BAINES, DERBY, HARRISON, and G. LENG.*

THE declination of the sun, at the respective times, was $22^{\circ} 27' 13''$, and $22^{\circ} 25' 3''$. Now, having given the polar distance, the time, and latitude, the altitude of the sun's centre, at those times, is found to have been $44^{\circ} 0' 10''$, and $32^{\circ} 35' 25''$; and his azimuth, from the South, $65^{\circ} 18' 3''$, and $83^{\circ} 55' 42''$; whose sum = $149^{\circ} 13' 45''$ = the angle formed by the fences, at the tree. Again, by making proper allowance for semid. &c. the altitude of the sun's upp. limb. was $44^{\circ} 16' 50''$, and $32^{\circ} 52' 32''$; the natural tangents of which multiplied by 50, give 51, 271 and 77, 36, the sides of the field; $\therefore 51, 271 \times 77, 36 \times \frac{1}{2}$ nat. sine of $149^{\circ} 13' 45''$ = 1014, 5967 square yards, the area.

Also by *Messrs. Chapman, Gawthorp, Hine, Maffett, Mair, Tindall, Treeby, Winward, Whitley, Wiseman, and Yorke.*

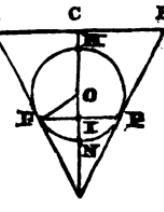
(73) *Answered by Messrs. ENGLAND and STRINGER.*

LET $a = 40$, inches the length of the rod, $B = 30$ oz. $a = 20$ oz. and x = its distance from the point of suspension; then, see Martin's Institutes, art. 1094, $(a^2 B + x^2 A) \div (a B + x A)$ = the distance of the centre of oscillation of the compound pendulum from the same point, a minimum; the fluxion of which made = 0, and reduced gives $x = a \div A \times \sqrt{AB + BB} - a B \div A = 17,4596$.

Similar answers were received from *Messrs. Baines, Chapman, Derby, Gawthorp, Harrison, Hine, G. Leng, Maffett, Mair, Tindall, Treeby, Winward, Whitley, Wiseman, and Yorke.*

(74) Answered by Messrs. GAWTHORP and HUDSON.

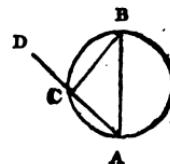
THE centre of the globe is O; P, F the points where it touches the glass ABD. Join FO, FP; then, $AC : AD = \sqrt{26} : 1$ $FO : OD = 3\sqrt{26} : 4$; and $DO - NO = ND = 3,0742646$. Again, $AD : AC = FO : OI = 3 : 4\sqrt{26}$; and $ON - OI = NI = ,6029129$; \therefore the solidity of the segment, (see Bonny. Mens. prob. 14) $= ,5236 NI^2 \times (3HN - 2NI) = ,6269824$.



Also by Messrs. Baines, Chapman, Derby, Harrison, Hine, Killingbeck, Lamplugh, G. Leng, Maffett, Mair, Page, J. Tadman, Tindall, Treeby, Winward, Whitley, Wiseman, and Yorke.

(75) Answered by Messrs. BAINES, MAFFETT, WISEMAN, and YORKE.

HAVING given the latitude ($53^\circ 28'$) and the sun's declination ($19^\circ 52' 55''$) at 9 o'clock, the altitude of his centre is found $= 41^\circ 59' 52''$, the apparent alt. of his upper limb $42^\circ 16' 38''$, and azimuth, from the South, $63^\circ 28' 42\frac{1}{2}'' = \angle CAB = c$. Again, the sun's declination, at noon, was $19^\circ 54' 52''$; \therefore the alt. of his centre was $56^\circ 26' 32''$, and app. alt. of upper limb $56^\circ 42' 55''$.



Let x = the height of the pole, a and b the cotangents of the app. alt. of sun's upper limb, at 9 and 12, and $m = 40$ yds.; then $bx = AB$ and $ax = AD$; $\therefore AC = AD - DC = ax - m$; hence, in the right-angled triangle ACB, $\cos. c : ax - m :: 1 : bx$; $\therefore x = \frac{m}{a - bc} = 49,58373$ yds. and $AB = bx = 32,5515$ yds. = the diameter.

Also by Messrs. Chapman, Derby, Gawthorp, Harrison, Hine, G. Leng, Longdin, Mair, Tindall, Treeby, Winward, and Youle.

(76) *Answered by Mr. WHITLEY, Rotherham.*

PUT $d = 10$ feet, the depth of the water, $h = 12$, the height of the wall, and $x =$ its thickness; $n = 11$, and $m = 7$, the specific gravities of the water and wall; then the area of a vertical section of the wall, at right angles to one of its faces, $= hx$: whence, (by prob. 45, vol 2, Hutton's Course) the resistance of the wall $= hx \times \frac{1}{2} x \times n = \frac{1}{2} hn x^2$; also, ibid. the effort of the water to overturn the wall $= \frac{1}{3} m d^3$. But when the wall just supports the fluid, these two forces are equal to each other, that is

$$\frac{1}{2} hn x^2 = \frac{1}{3} m d^3; \therefore x = d \sqrt{\frac{md}{3nh}} = 4.204 \text{ feet.}$$

The same by Mr. GAWTHORP, Leeds.

IF $2x$ be the thickness of the wall, its force to withstand the pressure of the water will be as $12 \times 2x \times x \times 11 = 264 x^2$; and that of the water to overturn the wall, as $10 \times 5 \times 7 \times \frac{1}{3} = \frac{1500}{3}$: but in the case of an equilibrium, these forces must be equal; therefore $264 x^2 = \frac{1500}{3}$; hence $2x = 4.204$ feet.

Also by *Messrs. Baines, Chapman, Derby, Hine, Harrison, Killingbeck, Lamplugh, G. Leng, Longdin, Maffett, Mair, J. Tadman, Tindall, Treeby, Winward, Wiseman, and Yorke.*

(77) *Answered by Mr. LAMPLUGH, Walkington.*

LET $x + 4$ and $x - 4$ represent the numbers; then, per problem, $x + 4^4 - x - 4^4 = 14560$; or $x^4 + 16x^2 = 455$; this equation multiplied by x gives $x^4 + 16x^2 = 455x$. Again adding $49x^2 + \frac{65}{2}x^2$ to each side, and $x^4 + 65x^2 + \frac{65}{2}x^2 = 49x^2 + 65 \times 7x + \frac{65}{2}x^2$, two perfect squares; $\therefore x^2 + \frac{65}{2} = 7x + \frac{65}{2}$, and $x = 7$; hence $7 + 4 = 11$, the greater number, and $7 - 4 = 3$, the less.

Also by *Messrs. Baines, Chapman, Gawthorp, Harrison, Killingbeck, G. Leng, Maffett, Mair, Page, Tindall, Treeby, J. Tadman, Winward, Whitley, Walkington, and Yorke.*

(78) Answered by Mr. GEORGE LENG, Hull.

WHEN the upper limb of the sun appears in the horizon, his centre is $48' 38''$ below it; and when his lower limb seems to touch the horizon, his centre is $17' 4''$ below it; vide Bonnycastle's Trig. page 250. 2d Edition.



In the annexed figure, Z represents the zenith, P the pole, S, O, the places of the sun at the times of observation; therefore, $ZS = 90^\circ 48' 38''$, and $ZO = 90^\circ 17' 4''$. In the $\triangle OPS$ are given $OP = SP = 66^\circ 32'$ ($90^\circ - 23^\circ 28'$) and $\angle OPS = 2^\circ (8')$ to find $OS = 1^\circ 50' 4\frac{1}{2}''$, and $\angle POS = 89^\circ 36' 7''$. In the $\triangle OZS$ are given ZS , ZO , and OS to find $\angle ZOS = 106^\circ 40' 28''$. Again $ZOS - POS = 106^\circ 40' 28'' - 89^\circ 36' 7'' = 17^\circ 4' 21'' = \angle ZOP$. In the $\triangle ZOP$ are given ZO , OP , and $\angle ZOP$ to find $ZP = 28^\circ 58' 8''$ the colatitude; $\therefore 90^\circ - 28^\circ 58' 8'' = 61^\circ 1' 52''$, the required latitude.

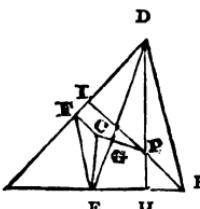
Nearly in a similar manner was this problem answered by Mr. GAWTHORP, who adds the following *remark*: In the first solution to this problem, in the L. Diary, the refraction is subtracted from 90° , and the parallax added to it. The same fault is committed in the solution to the 7th (1035) question L. Diary, 1798.

Also by *Messrs. Baines, Harrison, Hine, Maffett, Mair, Treeby, Winward, and Whitley.*

(79) Answered by Mr. PAGE, Westwood Cottage, near Beverley.

BISECT AB, AD, in E and F.
Raise the perpendiculars EC and FC to intersect in C; then will C be the centre of the circumscribing circle.—
Draw BI, DH, perpendicular to AD and AB; then will the point P be A the intersection of the perpendiculars.

Draw FE, DE; also CP, cutting DE in G, the centre of gravity. *Dem.* As $AF = FD$, and $AE = EB$; $\therefore FE = \frac{1}{2}$



BD. Again, as FE is parallel to DB, CE to DP, and FC to PB, the triangles FCE and DPB, are similar; \therefore as $FE = \frac{1}{2} DB$, $EC = \frac{1}{2} DP$. Moreover the triangles EGC and DGP are similar; and as $EC = \frac{1}{2} DP$, $EG = \frac{1}{2} GD$, the distance of the centre of gravity from E; consequently C. G. P. are in the same straight line.

Also by *Messrs. Gawthorp, Harrison, Hudson, Lamplugh, G. Leng, Mair, Whitley, and Yorke.*

(80) *Answered by Mr. BAINES, Reading, and Mr. MAFFETT, Plymouth.*

LET x = perpendicular; then $2\sqrt{100 - x^2}$ = the base, $20 + 2\sqrt{100 - x^2}$ = perimeter, $x\sqrt{100 - x^2}$ = the area, $50 \div x$ = the rad. of the circumscribing circle, (see Em. Alg. 415,) and $x\sqrt{100 - x^2} \div (10 + \sqrt{100 - x^2})$ = rad. of the inscribed circle; hence $50 \div x - x\sqrt{100 - x^2} \div (10 + \sqrt{100 - x^2}) = 3$; whence $x = 8.3983$; \therefore the base = 10.857, and area = 4A. 2R. 9 — 44P.

Also by *Messrs. Darby, Gawthorp, Harrison, Hine, Ford, Lamplugh, Mair, Page, Treeby, Winward, Whitley, and Yorke.*

(81) *Answered by Mr. WHITLEY, Rotherham.*

LET ACB be the given triangle; from B, one extremity of the longest side, AB; draw BT, cutting AC in T, so that $AT = \frac{1}{2} AC$ and from T draw TM, bisecting AB in M: then, if the parabola AVB be described, having TM for a diameter, and to which TA, TB shall be tangents at A, and B, it will divide the triangle ACB into two equal parts.



Dem. Draw CD perp. to AB: and let EI, the tangent at the vertex V, cut AC in E, and CD in I. Now, by conics, $VM = VT$; also EI is parallel to AB; therefore, $AE = ET = \frac{1}{2} AT = \frac{1}{2} AC$: whence by parallels, $DI = \frac{1}{2} DC$; but the area of the parabola $AVB = \frac{2}{3} AB \times DI = \frac{2}{3} AB \times \frac{1}{2} DC = \frac{1}{3} AB \times DC = \frac{1}{3}$ the area of the triangle ABC; consequently, the curve AVB divides the \triangle ABC into two equal parts.

Also by *Messrs. Gawthorp, Harrison, Hine, Hudson, Killingbeck, Lamplugh, Maffett, Page, Treeby, and Winward.*

(82) *Answered by Mr. GLENDENNING, Farnswoth.*

By Mercator's sailing, as prop. diff. lat. : mer. diff. lat. :: depart. : diff. long. ($= D$) And by mid. lat. sailing, as $\cos.$ mid. lat. : rad. :: depart. : diff. long. ($= d = \frac{D}{n}$)

Therefore by equality, as rad. : $\cos.$ mid. lat. :: mer. diff. lat. : $n \times$ (prop. diff. lat.)

Let $2L$ represent the arc which measures the given lat. ; m the meridional parts corresponding thereto; and $2x$ the req. lat.; then is $(L + x)$ the middle lat. $2(L - x)$ the proper diff. of lat. and $m -$ (mer. pts. corresponding to arc $2x$) the meridional diff. of lat. and the last analogy becomes

Rad. : $\cos.$ $(L + x)$:: $m -$ (mer. pts. for arc $2x$) : $2n$
 $(L - x)$

But $\cos.$ $(L + x) = \cos.$ $L - \frac{\sin.$ $L}{r} x - \frac{\cos.$ $L}{2r^2} x^2 +$
 $\frac{\sin.$ $L}{2.3r^3} x^3 + \frac{\cos.$ $L}{2.3.4r^4} x^4 - \frac{\sin.$ $L}{2.3.4.5r^5} x^5 - \&c.$

And $m -$ (mer. pts. for arc $2x$) = $m - \left(\frac{1}{a} \times 2x + \frac{\overline{2x}^3}{6} + \frac{\overline{2x}^5}{24} + \frac{\overline{2x}^7}{83} + \frac{\overline{2x}^9}{203} + \&c. \right)$

where r = rad. and $a = .000290888$ the length of an arc of 1 min. to rad. 1.—Whence by writing s for the sine of L , C for its cos. 2 for n , 1 for r , and multiplying extremes and means, we obtain $acm - 4aL = (ams + 2ac - 4a)$
 $x + \frac{acm - 4s}{2} x^2 - \frac{ams + 2c}{2.3} x^3 - \frac{acm + 24s}{2.3.4} x^4 -$

$\frac{ams + 9oc}{2.3.4.5} x^5 + \&c.$ Ascertain the value of x in terms,

of the given quantities, and to evade prolix expressions in the resulting series, substitute Q for $acm - 4aL$, $A, B, C, D, \&c.$ for the co-efficients of $x, x^2, x^3, x^4, \&c.$

and we have $x = \frac{Q}{A} - B \frac{Q^2}{A^3} + (AC + 2B^2) \frac{Q^3}{A^5} -$

$$(5ABC + 5B^3 - A^2D) \frac{Q^4}{A^7} + (21AB^2C + 14B^4 + 6A^2BD + 3A^2C^2 - A^3E) \frac{Q^5}{A^9} \text{ &c.} = .3523385 \text{ which cor-}$$

responds to an arc of $20^\circ 11\frac{1}{4}'$ to radius 1; whence the desired lat. or $2x = 40^\circ 22' 30''$ N.

Hence, Mer. diff. lat. : diff. long. :: rad. : tan. course S. $4^\circ 11' 27''$ W.

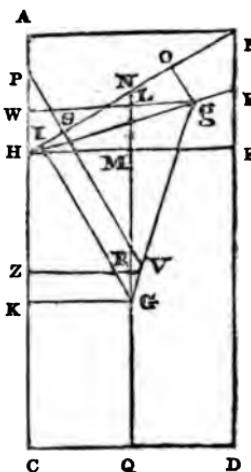
And, cos. course : prop. diff. lat. :: rad. : dist. 2925.322 miles.

Also by *Messrs. Hine, Maffett, Treby, Winward, and Yorke.*

(88) Answered by Mr. GAWTHORP, Leeds.

LET $ABCD$ represent a section of the pot, through its axis, perpendicular to the horizon, QN its axis, P the point of suspension, HB the surface of the water, and G, g , the centres of gravity of the parts $CDHF$ and HBF . Through g draw HgE , cutting DB in E ; and, on HB , demit the perpendiculars PS , GI , and gO . Now, it is manifest, the weight of the cylinder $CDHF$, will act at I ; and that of the part, HBF , at O ; these weights are as $CD^2 \cdot DF$ (QM), and $CD^2 \cdot EF$ (MN); or, as DF and FE ; therefore, when the pot is at rest, $IS \cdot DF = SO \cdot EF$.

Again, put $x = MN = EF = BE, a = \frac{1}{2}DB = GN, m = HF = CD, n = \frac{1}{2},$ and $v = HB;$ then $HE = \sqrt{m^2 + x^2}, Hg = n \cdot HE, HO = n \cdot (m^2 + v^2) \div 2v;$ and, as the triangles HBE, GNI , and PHS are similar, $IN = 2ax \div v,$ and $HS = \frac{4x^2}{v} - 2x \div v;$ $\therefore SO = HO - HS = n \cdot (m^2 + v^2) \div 2v - (\frac{4x^2}{v} - 2x) \div v,$ $SN = \frac{1}{2}v - HS,$ and $SI = IN - SN = (2ax + \frac{4x^2}{v})$



$-2x) + v - \frac{1}{3}v$; these values being substituted in the equation, $IS \cdot DF = SO \cdot EF$, will give. (by proper reduction, and noticing that $v = \sqrt{m^2 + 4x^2}$) $x^3 = 1.8x^3 - 21.9x = -21.6$; $\therefore x = .9594$, and the content $= CD^2 \cdot DE \times .7854 = 9 \times (6 - .9594) \times .7154 = 35.63$ cubic inches.

The same by Mr. WISEMAN, Hull.

In the above figure, G is the cen. of grav. of $DCHF$, V of $DCHB$, g of FHB , and P the point of suspension. Draw KG , ZV , HF and Wg perpendicular to CA ; and join PV , Gg ; the centre of grav. g will be in the line HE , bisecting BF , in E ; and $Hg = \frac{1}{2}HE$.

Put $x = AH$; then $DE = 6 - \frac{x}{2}$, $HW = \frac{5}{16}x$, $WK = KC = 3 - \frac{x}{2}$ and $WK = 3 - \frac{3}{16}x$. By Statics $DCHB : FHB$, or $DE : FE :: WK : KZ$, that is $6 - \frac{x}{2} : \frac{x}{2} :: 3 - \frac{3}{16}x : \frac{3}{16}x \times \frac{16 - x}{12 - x} = KZ$; and $CP - CK = ZK$, or $5 - (3 - \frac{x}{2}) - \frac{3}{16}x \times \frac{16 - x}{12 - x} = 2 + \frac{x}{2} - \frac{3}{16}x \times \frac{16 - x}{12 - x} = ZP$. Again $WK : Lg :: KZ : RV$, or $3 - \frac{3}{16}x : \frac{3}{8} :: \frac{3}{16}x \times \frac{16 - x}{12 - x} : \frac{3x}{8 \times 12 - x} = RV$; $\therefore ZV = 1\frac{1}{2} + \frac{3x}{8 \times 12 - x} = \frac{9}{8} \times \frac{16 - x}{12 - x}$. Now, PV being perp. to HB , $AB : AH :: PZ : ZV$, or $3 : x :: 2 + \frac{x}{2} - \frac{3x}{16} \times \frac{16 - x}{12 - x} : \frac{9}{8} \times \frac{16 - x}{12 - x}$; $\therefore \frac{27}{8} \times \frac{16 - x}{12 - x} = 2x + \frac{x^2}{2} - \frac{3x^2}{16} \times \frac{16 - x}{12 - x}$; whence $x = 1.9188$; and 35.63 solid inches, the quantity the suspended vessel will hold.

The same by Mr. WHITLEY, Rotherham.

As the vessel is considered without weight, PV will be perpendicular to the horizon, consequently to HNB, the

surface of the water. Draw VZ , HF parallel to CD , cutting QN in R and M respectively ; and let G be the middle of QM ; then, vide page 28th, part 2d, vol. 1. Leybourne's Rep. New Series, $GR = \frac{1}{2} MN$ plus $MN^2 \div 8NQ$, and $VR = HM$. $NM \div 4NQ$; hence $VZ = VR$ plus RZ (HM) $= HM$. $NM \div 4NQ$ plus HM , and $CZ = QR = GQ$ ($\frac{1}{2} QM$) plus $GR = \frac{1}{2} QM$ plus $\frac{1}{2} MN$ plus $MN^2 \div 8NQ$. Now, as the right-ang. Δ s HMN , VZP are similar. $MN : HM :: VZ : PZ$; therefore $PZ = HM^2 \div 4QN$ plus $HM^2 \div NM$, and $CP = CZ$ plus $PZ = \frac{1}{2} MQ$ plus $\frac{1}{2} MN$ plus $NM^2 \div 8NQ$ plus $HM^2 \div 4NQ$ plus $HM^2 \div NM$. Put $CP = d = 5$, $BD = a = 6$, $HM = \frac{1}{2} CD = 1.5$, and $MN = x$; then $QM = a - 2x$, and $NQ = a - x$; hence $\frac{1}{2} a - \frac{1}{2} x$ plus $x^2 \div 8(a - x)$ plus $r^2 \div 4(a - x)$ plus $r^2 \div x = d$; whence $x = .9594$ inch ; \therefore the content of the water $= CD^2 . NQ \times .7854 = 35.68$ cubic inches.

Also by *Messrs. Baines, Glendenning, Hine, Killingbeck, Maffett, Putsey, Treeby, Winward, and Yorke.*

New Mathematical Problems.

(84) *By Mr. TREEBY, Plymouth.*

MAKE $x^2 - y$ and $x^2 - 3y$ squares.

(85) *By Mr. LAMFLUER, Walkington.*

GIVEN x plus $y = \frac{65}{x}$, and $2xy = 2y^2$ plus 21 , to find the values of x and y , by a quadratic.

(86) *By Mr. KILLINGBECK, Barton-le-Willows.*

INTO a conical glass, full of water, was put a heavy sphere, two inches in diameter ; which, when just immersed in the water, displaced half of it : required the dimensions of the cone.

(87) *By Mr. BURDON, Acaster Malbis.*

On the morning of June 6th, 1814, the altitude of the sun was observed to be 25° ; and, on the same

when his azimuth was the same as at the former observation, his altitude was 75° . Required the latitude of the place, and the times when the observations were taken.

(88) *By Mr. HARRISON, Burton-Pidsea.*

GIVEN the base and vertical angle, to construct the plane triangle, when the rectangle of the perpendicular, from the vertical angle, and difference of the segments of the base, made thereby, is a *maximum*.

(89) *By Mr. DERRY, Leeds,*

In the year 1814, the sun's altitude, when due West, was $30^{\circ} 30'$; and on the same day, at half past five o'clock, his alt. was $19^{\circ} 30'$: required the sun's declination, the day of observation, and the latitude of the place, it being North.

(90) *By Mr. PAGE, Westwood-Cottage.*

GIVEN the three sides of any plane triangle, to find the length and position of three lines, which will divide the triangle into five other triangles; four of which shall be in arithmetical proportion.

(91) *By Mr. WHITLEY, Rotherham.*

To determine, geometrically, a point in a straight line, given in position, from which if two tangents be drawn to two circles, given in position and magnitude, their sum shall be the least possible.

** In getting up the 4th half sheet of our last number, we were much pressed for want of time, which caused the names, &c. of those gentlemen, who answered this problem to be, accidentally, omitted. As the problem is a curious one, we re-propose it for further consideration.

(92) *By Mr. ENGLAND, Normanby.*

SUPPOSE the distance from Barton to Hull to be eight miles, and the width of the Humber, uniformly, three miles; and that a sloop sails directly from Barton to Hull, at the rate of three miles per hour; while, at the same moment, a boat sets off, (to land a passenger on the opposite side,) at the rate of seven miles per hour.— Required the least time possible, in which the boat can reach the sloop again.

(93) *By Mr. BAINES, jun. Reading.*

FIND three numbers in geometrical progression, to which, if 16 be severally added, the three sums thence arising shall be rational squares.

(94) *By Mr. GAWTHORP, Leeds.*

IF from a given point P, a line be drawn to meet the tangent MT, drawn to a circle, given in magnitude and position; what is the locus of the point M, when $MT = MP$?

(95) *By Mr. GLENDENNING, North Yarmouth.*

DIVIDE a given square number into two such parts, that the sum of their cubes may be a square.

Review.

A Treatise of Algebra, in Practice and Theory, in Two Volumes, with Notes and Illustrations; containing a variety of particulars relating to the Discoveries and Improvements that have been made in this Branch of Analysis. By J. BONNYCASTLE, Professor of Mathematics in the Royal Military Academy, Woolwich. Price 24s. boards.—J. JOHNSON and Co.

Whoever has made any acquirements in Mathematics, must be convinced that no branch thereof is of greater use than Algebra; it assists in solving the most abstruse problems more expeditiously than any other method. To this art, Arithmetic owes its greatest improvements; and frequently by it, geometrical demonstrations are rendered more perspicuous; in short, *Vix quicquam in universâ Matheri ita difficile aut arduum occurrere posse, quô non iuaffenso pede per hanc methodum penetrare liceat.* In this state of society, the mathematical sciences are so intimately connected with human affairs, that it may justly be concluded—that he, who has not a knowledge of Algebra, understands but little.

In 1782, Mr. B. published a useful compendium of Algebra, *formed on the model of* Newton, MacLaurin, Emerson, &c. or more properly, *a selection from the works of these great men.* This little work is neatly got up: its preface is not inferior to any composition in the English language; indeed, we do not recollect ever having *read so many facts brought into so narrow a compass, and couched in such elegant terms.* We may be told that the subject matter is *in Emerson's prefaces, &c.*; this we do not deny; but speak only of *the execution:* and we wish to hold out this preface, as a proof that mathematicians can write as well as any other men.

(To be continued.)

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A REPLY TO THE MONTHLY REVIEWERS.

MR. EDITOR,

WHEN I wrote to you last, I was inclined to particularize several of the obvious evils which the M. Reviewers have intended against mathematicians; but on committing my thoughts to paper, I found that the subject would require more space than could be devoted to a full enumeration of individual grievances; therefore, I shall only mention a few instances to evince their designs to smother the fame of as learned and worthy men as ever existed.

It is a circumstance of great exultation, that it is seldom, if ever, in the power of the most malignant reviewer to inflict a wound, on reputation, as severe as his rancour. Observation and occurrences soon lay open the design of the assassin; and his attempts to disseminate his detractions are rejected with scorn, by those who are acquainted with the subject, and have a due sense of honour. Hence it is that writers, level to the capacities of readers, are, in general, soon relieved from the consequences of the unjust strictures of reviewers. Their disapprobation, if not severely unfair, makes but a slight impression, which is quickly erased by reflection and candour; and if it be directed with boldness and malignity, it recoils on the publication in which it appears.—The case is different with those who publish on scientific subjects: “*the judges of such productions are comparatively*

very few, and they are very thinly scattered ; and, therefore, authors of this class are much at the mercy of a reviewer, if he is determined to lower or stifle their reputation. His misrepresentations are boldly imposed on general readers as fair criticism, and his falsehoods, cautiously expressed, are advanced with an air of integrity. The detraction is read by the many, and spread far and wide : the power of detecting its want of truth is limited to the few, and cannot be propagated with any degree of precision, but by writing."

Mr. Emerson, in the preface to his *Principles of Mechanics*, says, *these trifling critics are always snarling at what they do not understand ; and that we are not to be surprised at their condemning other men's works, when not written after their crude notions.*

On the appearance of his *Algebra*, a work not inferior to any ever written on the subject, these ignorant pretenders, as he terms them, again assailed the labours of that great man ; but he was not to be intimidated by their "trifling objections." He manfully encountered his host of foes; his castigation taught them wisdom, and compelled them to confess, on another occasion, that they had no desire to incur Mr. Emerson's contempt.

In later times, they have attacked other authors, and some of them repeatedly, as Hutton, Vince, Wood, Gregory, &c. Their publications have been misrepresented, and their talents malevolently depreciated. But lest I should make this article too extensive, I shall only mention an instance of their treatment of that venerable scholar, Dr. Hutton. About fourteen years ago, he published a second edition of his *Treatise on the Principles of Bridges* ; and nearly at the same time, the late Mr. Atwood laid before the public a *Dissertation on the Construction and Properties of Arches*. The appearance of the two publications, on the same subject, induced the M. Reviewers to form the ridiculous and unjust design of exalting the mathematical character of Mr. Atwood, and depressing that of Dr. Hutton. *Critiques* of this tendency, written, as Dr. Robertson observes, without a knowledge of the subject, were inserted in the *Review* ; "and falsehoods, sufficiently extensive, were cautiously introduced, in order to form a pretence for praise and detraction."

Dr. Hutton; to arrest the progress of this nefarious design, addressed a long letter to the Editor of the M. Magazine, which may be seen in the number for August, 1802. Not long after this, the M. Reviewers, on again mentioning Mr. Atwood's book, were constrained to say —“if it were permitted to us to revise old judgments, we should subtract something from the portion of commendation, which was formerly allotted to our author !!!” An additional proof of the folly of men undertaking to execute that task to which they are incompetent. Those creatures seem to have no compunction in endeavouring to hand an author over to oblivion, and to render abortive, those labours, which, without their interference, might be useful to society; but I forbear, *at present*, to pursue the subject; so shall endeavour to expose the futility of their remarks on my *Arithmetical Preceptor*.

These gentlemen, after making some idle remarks on arithmetical writers, say, “he ought to have consulted the best authors, and availed himself of their improvements. Had he followed this plan, he certainly would not have given the Rule which he has stated for Compound Proportion;” namely, the *Rule of Five*. To those who have not read my book it might appear from these Reviewers' partial remarks, that I had given no other rule than that of the *Rule of Five*; but I have also inserted the *General Rule* for any number of odd terms, after the manner of those approved authors, with an example worked at length, and a reference to tutors to use either of the rules at discretion. The *Rule of Five*, they say, is founded on error, and, in many cases, gives erroneous conclusions.

As what they assert cannot be proved without an example, which they have not given, it is necessary to propose a question of that kind, to which, I presume, they allude; and which, if possible, will produce those wrong conclusions: If 54 men can build a wall in 18 days, when the day is 17 hours long; in how many days will 68 men build the same when the day is but 9 hours long? Now, in the *Rule of Five*, there are three conditional terms; those terms imply, 1st. an agent, or a principal cause of

loss, gain, &c. 2dly. the time required to produce an effect; or space passed over to accomplish the same, which is always in the ratio of the time; and, 3dly. the effect itself; that is, the gain, loss, &c. But in the question before us, no one of the three terms which form the supposition, denotes an effect: consequently, the third place in the stating cannot be occupied.

Observe now the profound sagacity of these critics: they have discovered that the *Rule of Five*, in many cases, gives erroneous conclusions, when, in fact, no conclusions can be derived from such questions proposed; as their terms are inapplicable to the required data. This question, and similar ones, must be solved either by the *Rule of Three*, by combining the 2nd and 3rd terms into one, which are only component parts of the same thing, or by the *General Rule for Compound Proportion*. Thus by the *Rule of Three*: If 54 men in 306 hours, (18×17) , build a wall; in how many hours can 68 men build it? The answer is 243 hours, or 27 days of 9 hours long. By the *General Rule*, we have $54 \times 18 \times 17 \div 68 \times 9 =$ also to 27 days. Now, in this operation, the three conditional terms 54, 18, and 17, constitute the dividend, which is incompatible with the *Rule of Five*, as one of these terms, at fewest, will always be a component part of the divisor. Therefore it is evident, from what has been said, that questions of this sort do not appertain to the Rule. In every example where proper data can be established this Rule is infallible: for a proof of my assertion, I refer the reader to the demonstration given at page 373, which the Reviewers seem not to have noticed.

There are some questions which have five terms, and though two of them may be incorporated, as in the former question, and worked by the *Rule of Three*; yet they may also be solved by the *Rule of Five*: such is the 10th question, page 116: Suppose a person travel 135 miles in 4 days, when the days are 15 hours long; how many miles can he travel in 6 days, when the days are 9 hours long? It might be supposed that this question was similar to the foregoing one; but it is totally different: the term 135 miles does not belong to the 2d place in the stating; but to the 3d: it is the number of miles gained by the traveller in consequence of his four days walking: hence these four

days may be accounted the principal cause of this gain ; which being put in the 1st place, and the 15 hours in the 2d, evidently indicates the question to be of the *Rule of Five*.

I shall now proceed to the next thing which has attracted these gentlemen's notice. In his *Rule of Three*, say they, he unnecessarily divides the Rule into two cases, *Direct* and *Inverse*. Perusing various modern authors on this subject, I find by far the greater part has divided the Rule in the same manner. Among these are the Rev. J. Joyce, and Mr. Thomas Keith ; also, Professor Bonnycastle, except in the last edition of his work. I take it for granted that these are such authors as the Reviewers think worthy of imitation. Mr. Bonnycastle, in the former editions of his Arithmetic, says, that young people in general find the Rule more intelligible by preserving the common distinctions ; and with him I entirely agree. But I beg leave to remark, as I did before when speaking of the *Rule of Five*, that I have inserted the *General Rule for Single Proportion*, without regard to *Direct* or *Inverse* ; and have given some examples for its application—A consideration alone sufficient to obviate any objections on this head.

They next advert to the manner I have stated the terms, which is thus : 3 gallons : 19 shillings :: 126 gallons : 798 shillings. What ratio, say they, can subsist between 3 gallons and 19 shillings : meaning that as the terms 3 gallons and 19 shillings are of different names they cannot be compared. I readily allow that 3 gallons bear no proportion to 19 shillings ; nor have I any where asserted the contrary. In this part of their Review, they have, through inattention (a fault for which they have been corrected twice before,) performed their business most bunglingly. Have I not expressly said, immediately before the rule at page 90, that the four terms, 3 yards, 5 shillings, 18 yards, and 30 shillings, are alternately proportional, and how can they, with justice, assert the contrary ? These *four terms* are in the same proportion as the *first four*. The arrangement of the terms which they *approve*, I suppose is the following : 3 gallons : 126 gal-

lons: 19 shillings: 798 shillings. Now, in the first arrangement, the two conditional terms are adjacent, as is also the case in whatever form the question is proposed. Whereas, in the latter, these terms are always separated, which I think an obstacle to learners on their entering the rule. They then say, exultingly, "had not this inconsistency of former authors been pointed out by later writers, we might have been less disposed to censure it in the present work, &c." Who, I might ask, has pointed out this inconsistency? All the preceding authors, save Bonnycastle, in his last edition, and others of equal eminence, (Sir Jonas Moore, Malcolm, Emerson, &c.) state the terms in the manner I have done.

Of the *Logarithmetical Tract* they say "we wish to see this take the place of many useless rules with which most of our treatises are encumbered; particularly the *Rule of Position*, which is, in fact, worse than useless. We would also explode all those that are commonly given under the terms *Factorage*, *Brokerage*, *Insurance*, *Barter*, *Loss* and *Gain*, &c. which are merely so many cases of simple proportion, and ought to be included under one *General Rule*." As these gentlemen appear such great advocates for General Systems, not only from what they say here, but from their reprobating the *Particular Rule of Five*, and the common division of the *Rule of Three*, they had better write a Treatise on this their favourite plan: for though I believe they could not persuade Tutors to introduce it into their schools, yet as we have such a display of their eminent abilities in the foregoing Critique, it would undoubtedly be rendered a valuable acquisition to men of science. The *Rule of Double Position*, I esteem a very curious one; an investigation of which, is given at page 391. It is applied to determine the results of various abstruse problems in different parts of Mathematics, particularly in Astronomy, which could scarcely be obtained by any other means. The great Emerson uses the Rule in various instances; and Dr. Hutton applies it to the solution of affected equations. The above authorities, I think, are sufficient to convince these Reviewers that this very useful Rule should not be discarded from our arithmetical compositions.

In the *Magic Squares*, they have not noticed a single article, the cause of which may be inability, as the subject is not generally known. They have, however, condemned it *en masse*, by which, I presume, the reader will see the situation in which these Critics appear. Not being able to analyze the work, they have here said what every ignorant pretender would say, that it ought to be omitted.

I now tell these gentlemen that an air of arrogant selfishness runs through their whole performance. Their object in writing seems to be solely that of depreciating the book, which induces me to conclude they are either authors, or the tools of some one who would have no work approved but his own. This want of probity, added to the gross blunders they have committed, evidently shews that they are not at all calculated for Mathematical Reviewers. In a word, their remarks can be of no avail to science. — Nay, to use their own phrase, which they have applied to the *Rule of Position*, 'they are even worse than useless.'

I am, Sir, yours, respectfully,

JOSEPH YOULE.

Sheffield, December 26th, 1814.

ON THE INVENTION AND ANTIQUITY OF MUSIC.

Of all human arts, Music justly claims the honour of antiquity; and, in support of this assertion, scarcely any authority is required: the necessity of the thing proves the certitude of the position. The condition and circumstances of man required some powerful charm to bear up his mind under the cares and anxieties to which he became subject, soon after his creation. Here the goodness of our Creator displayed itself, in the wonderful relief that music affords against the unavoidable hardships which are annexed to our state in this life. Music must have been as early in the world, as the necessary and indispensable arts; for, if we consider how natural to the mind of man this kind of pleasure is, which constant and universal experience sufficiently proves, we must naturally suppose *he was not long a stranger to it*. Arts were discovered, as necessity demanded, or luxury required; but neither necessity nor luxury was the parent of this heavenly art.

To be pleased with it, seems constitutional, though it is not absolutely necessary to our existence; yet it may be considered as the gift of the Lord of the Universe, to enable us to render ourselves more comfortable.—The effects ascribed to it by the ancients, are almost miraculous; by its means, it has been said, diseases have been cured, unchastity corrected, seditions quelled, and passions calmed. Therefore, it may reasonably be concluded, that this art was one of the first known to men.

This, like all other arts, was rude and simple in its infancy; but has been gradually improved by its native love of pleasure. Again, if we consider how obvious a thing sound is, and the manifold occasions it offers for our invention, we shall not only be convinced of the antiquity of this art, but enabled to draw satisfactory conclusions respecting its discovery.

Vocal Music was certainly the first kind, for man had not only the tones of his own voice on which to make his observations, but was daily entertained with the various natural strains of the winged choirs. He could not but observe them, and thence take occasion to improve his own voice, and the modulations of sound of which it is capable. It is certain that whatever power these singers had, they possessed it from the creation. We are surprised at their sagacious imitations of human art in singing; but we are ignorant that the species is capable of any improvement: and we may suppose that in those parts, where mankind first appeared, when things were in their greatest beauty and perfection, the singing of birds was a circumstance most remarked; and that from the natural concerts of birds, men would modify their voices in a melodious and agreeable manner. After that, wind instruments might have been first invented: Diodorus and other authors ascribing the invention to observations that were made on the whistling of the wind in reeds, and in the pipes of other plants. This was also the opinion of Lucretius:

“ At liquidas avium veces imitarier ore
Ante fuit multo, quam lœvia carmina cantu
Concelebrare homines possint aureisque juvare;
Et zephyri cava per calamorum sibila primum
Agresteis docuere cavas inflare cœutas.”

Other kinds of instruments were probably formed from similar accidents. There were so many uses for cords or strings, that men must naturally observe their various sounds, which might give rise to stringed instruments.—Instruments of percussion, as tabors and drums of different kinds, must have originated from the sonorous ringing of hollow bodies when struck. In support of this opinion on the invention of instruments, Kircher bids us consider that the first mortals leading a pastoral life, and being constantly in the fields, near rivers and among woods, could not be perpetually idle; it is probable, therefore, says he, that the invention of pipes, whistles, &c. was owing to their diversions and exercises on certain occasions.

If we consider the opinions of those, our ancients, who are yet too remote from the beginning of things to know them any other way than by conjecture and analogy, we find a universal agreement in this, that music is as ancient as the world itself; for this reason—that it is natural to mankind. It will be needless to adduce many authorities, let one or two suffice.

Plutarch, in his Treatise on Music, furnishes us with many examples, to prove the natural influence which music has on the mind of man; and that it is the most ancient, as well as the most noble science. *Quintilian*, (Lib. 1. cap. 11.) endeavours to prove that music is, of all sciences, the most ancient, as well as the most noble. *Homer* shows us how far music was advanced in his days, and the tradition of its greater antiquity, while he says it was a part of his Hero's education. The opinion of the divine origin and antiquity of music, is also proved by the fable of the muses, so universal among the poets; and by the disputes among the Greek authors, some ascribe the invention to *Orpheus*, some to *Amphion*, others to *Apollo*, &c. Also the greatest of the philosophers believed that music was, from the beginning, a peculiar gift and favour of heaven; and that it was necessary to assist the mind to an exalted way of praising the gods and good men. I shall add but one testimony more, which is from the sacred writings, where *Jubal*, the sixth from *Adam*, is called “the father of all such as handle the harp and organ.” Whether this signifies that he was the inventor, or only one who was eminently skilled in the performance thereof, we have

sufficient reason to believe that music was an art before his time ; hence it is rational to conclude that vocal music was known long before instrumental, and that there was a gradual improvement in the art of modulating the voice. If we could believe that this art was lost by the flood, yet the same nature remaining in man, it would soon have been recovered ; and we find a notable instance of it, in the song of praise which the Israelites raised with their voices and timbrels to God, for their deliverance at the Red Sea ; whence we may infer that it was an honourable art previous to that period.

The high reputation in which music was held by the Jewish nation, is, I suppose, well known from sacred history. Can any thing show the excellency of an art more than that it was accounted useful and necessary in the worship of God ; and as such diligently practised and cultivated by a people separated from the rest of mankind to be witnesses for the Almighty, and to preserve the true worship of God upon earth ? I have already mentioned the instance of the Israelites' song on their deliverance at the Red Sea, which seems to prove, that music, both vocal and instrumental, was an approved and stated manner of worshiping God ; and we cannot doubt but that it was according to his will ; for Moses, the man of God, and Miriam, the prophetess, were the chiefs of the sacred choir. From this time, to that of the royal prophet David, the art was honoured and encouraged both publicly and privately we can make no doubt : for when Saul was troubled with an evil spirit from the Lord, he was advised to call for a cunning player on the harp, which circumstance alone indicates it to have been a well-known art in that time. Behold David, yet an obscure and private person, being famous for his skill in music, was called ; and upon his playing, Saul was refreshed and was well, and the evil spirit departed from him. Nor when David was advanced to the kingdom, thought he this exercise below his attention, especially the religious use of it.—When the ark was brought from Kirjath-jearim, David and all Israel *played before God* with all their might, and with singing, and with harps, and with psalteries, and with timbrels, and with cymbals, and with trumpets. And the ark being set up in the city of David, what a solemn service was

instituted for the public worship and praise of God ; singers and players on all manner of instruments, to minister before the ark of the Lord continually ; to record, and to thank, and to praise the Lord God of Israel !—These seem to have been divided into three choirs ; and over them appointed three masters, Asaph, Heman, and Jeduthun, to instruct them, and to preside over the service ; but David himself was the chief musician and poet of Israel.

Also, when Solomon had finished the temple, behold ! at the dedication of it, the Levites which were the singers, all of them of Asaph, of Heman, and of Jeduthun, having cymbals, and psalteries, and harps, stood at the east end of the altar, praising and thanking the Lord. And this service, as David had appointed before the ark, continued in the temple ; for we are told that the king and all the people, having dedicated the house to God, the priests waited on their offices ; the Levites also, with instruments of music which David the king had made to praise the Lord.

The prophet Elisha knew the virtue of music, when he called for a minstrel to compose his mind, before the hand of the Lord came upon him. To this I shall add the opinion and testimony of St. Chrysostom, in his commentary on the 4th Psalm :—he says to this purpose : that God knowing men to be slothful and backward in spiritual things, and impatient of the labour and pains which they require, and willing to make the task more pleasing, and prevent their weariness, joined melody or music with his worship ; that as we are all naturally delighted with harmonious numbers, we might with readiness and cheerfulness of mind, express his praise in sacred hymns.—Nothing, says he, can raise the mind, and as it were, give wings to it ; free it from earthliness and the confinement it is under, by the union with the body ; inspire it with the love of wisdom, and make every thing pertaining to this life agreeable, like well-modulated verse and divine songs harmoniously composed. Our natures are so delighted with music, and we have so great an inclination and tendency to this kind of pleasure, that by it infants on the breast are soothed and lulled to rest. Again, he says, *because the pleasure is so familiar and connate with our*

minds, that we might have both profit and delight, God appointed Psalms, that the Devil might not ruin us with prophane and wicked songs.

In St. John's vision, the Elders are represented with harps in their hands: and, though this is only an ideal representation of things in Heaven, in a way the most easy to our conception, yet we must suppose it a comparison to the best manner of worshipping God among men; with respect, at least, to the means of composing and elevating our minds, or keeping out other ideas, and thereby fitting us for entertaining religious thoughts.

Guisbro.'

J. Y.

Mr. EDITOR,

As the education of youth is one of the most important objects that can engage the attention of mankind, numerous inquiries concerning the state of science and literature have been made by men of eminence and celebrity; but the characters and pretensions of Schoolmasters are, I believe, subjects rarely, if ever, thought of. A neglect which appears to proceed from a disregard for the interests and concerns of the rising generation.

Who is there, after maturely reflecting upon the necessity of a good education, and of the value and importance of literature; and who is also aware that "youth is a drama in which the future happiness and misery of life is, in a great measure, suspended?"—Who is there thus convinced of these weighty truths, that would place his children under the care of one who is totally ignorant of the requisites of education? Yet, Sir, strange as such conduct may appear, it is practised, as well as encouraged by thousands; for in every town, nay, in almost every village, there are numerous proofs of this assertion.

An affectionate parent would shudder to deprive his child of the necessities of life; but that parent, perhaps diverted too much by his secular concerns to superintend the education of his offspring, employs a man ignorant and inexperienced, to prepare his child for the various vicissitudes of life, and to draw out the beauties which nature may have implanted in his mind. Thus have many irreparably injured those in whom they ought to have

cherished "the generous purpose in the glowing breast." Error in the first principles is always productive of many and serious evils; this axiom will hold good in science, religion, &c.; but more especially in *education*. The minds of youth are pliant, and easily adopt the foibles, or imitate the virtues of their instructors. How careful then ought parents to be in the selection of him, upon whom they, as it were, repose their confidence, and to whom they delegate their power. Next to the sacerdotal function, that office of instructing youth, is the most important; and ought to be entered upon with mature deliberation, and a full conviction of being properly qualified for so important an undertaking.

In short, Sir, were all those who are employed in education carefully and impartially examined, how few would be found competent to teach those branches of literature which they daringly profess; how few to entertain just notions concerning literature itself; how many to be ignorant of what is required in an instructor of youth. It is no wonder that youth are so ill informed in those branches of education, over which they have spent a large portion of the most valuable part of their lives, when it is considered how grossly ignorant the people may have been, who have presided over their studies.

Many are the evils which arise from a bad education; and they are of that nature, that they frequently cannot be eradicated. What principles, then, can actuate that man who deceives the public, by deliberately assuring them that he is properly qualified to educate youth, when he is conscious that he has undergone no course of study, whereby he may be able to direct, as well as to advise those who are committed to his care. Of what mischief is that impostor guilty, who professes to teach those branches of science he does not understand. The fond father, animated by parental hope, looks for that excellence which he will never behold; and deplores, too late, the effects of a bad education. The following occurrence gave rise to the preceding thoughts:

Lately, at a public examination, several men offered themselves as *candidates* to teach an endowed Mathematical

school; and as persons acquainted with those branches of learning, which might be reasonably required in a school-master, to fill that important office. They were naturally conjectured to be conversant in mixed Mathematics; but, "what a falling off was there!" One, by his own account, was versed in every branch of Mathematical learning; yet, alas! on being desired to add two or three *proper fractions* together, he became dejected, confessed his inability, and retired from the scene of action.

A second candidate, who, like the other, was backed by numerous recommendations, seemed not so confident of his abilities, but doubtless thought himself a man of considerable learning; yet when the examiner began with Euclid's Elements of Geometry, candidly confessed he had never seen or heard of such a work!!!

A third affirmed, that he understood not only Arithmetic, but every branch of the Mathematics; but when his abilities were put to the test, frankly acknowledged that his memory was impaired through lapse of time; therefore, was under the necessity of relinquishing the contest.

A fourth was even found ignorant of any method of extracting the cube root; but still he *thought he could teach it!!!*

Thus, Sir, I might tire your patience by the relation of facts, which, though at first may excite a smile, will never fail to make every thoughtful person gloomy; especially when we consider that *these are the men* to whom the education of youth is, in a great measure, committed; and to whom it is reserved to qualify them to become useful to themselves, an honour to their friends, and an ornament to society at large.

Sutton, January 6th, 1815.

PHILOMATH.

ON THE FOLLY OF AFFECTATION,

Continued from page 12.

THEY require and expect a more than ordinary share of *domestic comfort*, and would, indeed, be ill repaid for a life of mental and bodily fatigue, by the caprice, the ill humour, or the affectation of an hysterical wife! In fact, *they do not treat their wives*, as they would their fair

patients. I am persuaded that many an unsuspecting damsel has found her *ci-devant devoted* Æsculapian swain transformed, as if by touch of magic wand, into an *indifferent, morose, or passionate husband*.—And here, good Mr. Visitor, let me not be misunderstood; I would by no means insinuate that the learned gentlemen of the faculty are, in general, more disposed to slight the women of their choice, than is any other description of men; and I should be sorry that any illiberal inference were drawn from what I have advanced; but the fact is this—they see and associate with a variety of women, amongst whom some are placed in situations of peculiar *delicacy and distress*, which excite the sympathetic and compassionate feelings—individuals amongst them may possibly appear more amiable, more estimable than their own wives.

Perhaps it is difficult in such a case to disguise the sensations of the heart; if the wife be petulant and perverse, negligent or extravagant, the husband almost involuntarily makes invidious comparisons; and, from similar sources, often proceeds the alienation of conjugal affections, which may be compared to the gradual declination of departing day; but with this distinction, we certainly perceive with regret, the approaching shadows of the evening; yet we invariably console ourselves with the reflection, that our eyes will, ere long, be cheered by the reviving fulgence of the light of day. Excuse, Sir, my prolixity:—Mrs. E. is not a woman of judgment; therefore, I concluded, it would be in vain to argue the point further, or to attempt to convince *her* of the insidious artifices of Dr. ——; so I took my leave, promising to return early on the following morning, and positively insisting upon conveying my intended patient to Woodbine Cottage, at the hour I had previously appointed. On my subsequent visit, at the hour of ten, I found Amanda still in bed! I took her hand:—“Dearest Amanda, said I, you must consent to accompany me to my rural retreat, in the course of two hours: the morning is fine, the country looks inviting, and all nature wears a smiling aspect—you will speedily be better by a little variety of scene.” She mournfully cast her soft and languid blue eyes at me,

saying :—" No, Madam, I cannot, I am too ill ; and Dr. —— has been to visit me this morning, and says I am unfit to rise from my bed this day." But dear Amanda, I replied, the ambient air will revive you ; we shall drive slowly, and yet be at my house before 2 o'clock ; you know not what a pleasant *romantic* spot it is ; let me intreat you not to disappoint me ; and if I find your health should be any *worse* for my projected experiment, I will, on my word of honour, send for your favourite friend Dr. ——. Will you, indeed, she quickly answered, and her countenance was illuminated with animation ; most assuredly I will, was my reply. I offered to assist her to arise, and in less than one hour she was nearly equipped for our expedition.

Judge of the surprise of her mother on entering her apartment ; the smile of affection shed a transient glow of joy upon her pallid cheek.—" Your daughter is much better this morning, Madam," I observed ; and has cheerfully consented to favour me with her company.—" Poor soul!" (said she,) " Thank God for his goodness to thee, my dear child" Ah, thought I, is it not presumption to thank the Almighty for the variations of caprice ? but I was silent ; I seldom, on common occasions, intrude a religious sentiment, where I know it will not be favourably received ; to do so, is, I think, to " *cast pearls before swine* ; and thus to cause persons to despise, more acrimoniously, the sublime truths of religion, than they otherwise might do.—We must *meet* those *prejudices* which we cannot *oppose* ; it is *wisdom* so to do ; and, consequently, it is *folly* to act the contrary part ; such conduct comes under the definition of " *a zeal without knowledge*." But to proceed :—Amanda next partook of a most plenteous repast, consisting of *tea*, *bread and butter*, *eggs*, and *cold ham* ! I smiled at the idea of the *plain* fare which would be substituted at my *Cottage* ;—no *tea* for hysterical women, no *butter* for weak stomachs, no *ham* for weak digestion, no *salted meats* for feverish brains ! At the hour of twelve, she was conveyed into the carriage. She was much fatigued ere we arrived at my rural *Cot*. In *truth*, these *hysterical affections* debilitate the whole *nervous system*, destroy the *vigour* of youth, and bring on a long train of disorders.

As soon as we reached Woodbine Cottage, I permitted her to retire to the apartment appointed for her reception. My house, Sir, is pleasantly situated ; the upper rooms command a view of the sea, whence it is distant about eight miles. I have a neat garden, to which is attached a shrubbery ; and one walk, in particular, my favourite resort, is completely shaded, by the foliage of luxuriant verdure, from the admission of Sol's sultry rays. This residence is exquisitely neat—the furniture is not expensive, but adapted exactly to a rural retreat—it is light and elegant. I have a rare and very choice collection of plants arranged in the vestibule, and I have also an excellent library ; so that there is not any thing, either in my cottage, or its vicinity, which can engender gloom or discontent. I prevailed with my patient to rise before tea, and join our party. She expressed herself much pleased with the scene which presented itself to her view. At a short distance from my cot, is a grove, the peaceful retreat of a feathered choir : thither, after tea, we strolled, and the remainder of the evening was occupied by cheerful conversation, and by music. I have a guest who performs in a pleasing style, but is not very scientific ; she, however, plays well enough to engage the attention, without possessing the powers of *astonishment*. I consider music as one means of relaxation which is perfectly innocent, if it be not extended to excess ; but quite the reverse, if a taste for it have been cultivated at the expense of a large portion of time, which might, assuredly, have been more profitably expended.—I forbear, good Mr. Visitor, now to enlarge ; I have trespassed, I fear, longer already on your time and attention than I ought. If so, pray reserve the latter part of this communication for a future number. If you wish to know my mode of effecting the recovery of my fair patient, inform me in your answers to correspondents ; otherwise, I shall not presume again to intrude on the candour of your readers.

I remain, yours, Sir,

Most respectfully,

ÆSCULAPIA.

ON APPARITIONS.

To the EDITOR,

SIR,—As my former communication on Apparitions met with insertion in the last number of the *Visitor*, I have resumed the pen, in order to fulfil a promise I then made of carrying the performance to a greater length.

Instances are not difficult to be procured, nor are they necessary, to support an assertion before advanced, that men, eminent for courage and learning, are frequently slaves to this degrading apprehension: they are so numerous and frequent, that it is almost impossible they should escape the notice of the most superficial observer. I shall here beg leave to refer the reader to the interesting tale, page 117, Vol. I. *Quarterly Visitor*, as it serves to strengthen my argument of early impressions.

Had men but resolution sufficient to follow to its termination, the dreadful object which they take for an apparition, or trace it to its source, they would, in general, find it something perfectly innocent, or at least within the limits prescribed by nature. Or if men would reflect that by the sense of seeing they can form no idea of distance, and if not aided by the touch, every object would appear to be within the eyes, and more or less bulky, as it approached or receded; insomuch that a fly near the eye, would appear larger than an eagle at a distance.—Experience alone has rectified this mistake; and it is from that source, ideas of distance and magnitude have been acquired.

Whenever, therefore, a man finds himself benighted in an unknown place, where, on account of darkness, no judgment can be formed of distance, or the figures of objects that may present themselves, he is every moment afraid of being misled, from not having an adequate idea of such objects: hence proceeds that internal and childish fear, which many people experience from the obscurity of the night; and of those strange and hideous figures which some tell us they have seen. Though such figures it is asserted exist solely in the imagination, yet they may really appear to the eye, and be, in every particular, seen as described; for when we reflect that whenever we cannot *see* of an unknown object: but by the angle which it

forms in the eye, the object is magnified in proportion to its propinquity ; and that if it appear, when at the distance of thirty or forty yards, to be only a few feet in height, when we advance within a short space of it, it will seem to be of considerable magnitude ; at which the spectator must naturally be astonished and terrified till he approaches and knows it. When he has actual perception of it, the tremendous appearance it assumed will vanish ; and it will appear in no other than its real form. If, on the other hand, he is afraid to approach it, and quits the place with precipitation, the only idea he can have of it will be that of the image which had been formed in his eye—the image of a figure he had seen, gigantic in its size, and horrible in its form.

To reason thus, would rescue many an harmless animal, many a bush or half-decayed stump, and many a white gate or guide-post from the obloquy under which it often labours, of being the real and terrifying object which the fears of those who behold it, make it appear.—One of the officers of Haslar hospital being dangerously ill, a medical gentleman, who was attending him, had occasion, about two o'clock, a fortnight ago, to send the nurse from the officer's house to the dispensary ; the weather being inclement, the nurse wrapped herself with a piece of red baize, covering also in part a candle and lantern, to prevent the light from being blown out, as the wind was very high.—The rays of light issuing from the red covering, she appeared, to the imagination of a sentry at a distance, a terrible spectre ; and as she approached him, his fears so increased, that he ran from his post with haste to the guard-house ; where, in about half an hour, he expired.—Had this man's mind been free from superstition, or untainted by the poison which had been instilled into it in his childhood, he would not thus have met a premature death.

The following fact will shew the propriety of investigating every appearance which seems to be terrific :—A friend of mind coming late one evening from Hilderthorpe to Bridlington, perceived something white at a short distance before him, which repeatedly seemed to rise from the ground, and at last to advance with an almost imperceptible motion along the middle of the road. Though

no respect superstitious, the terrors fixed in his mind, during his childhood, were rather awakened; and he felt a kind of shuddering sensation, better to be imagined than described;—he had the courage, however, to keep on the road rather than turn from it, and, at last, met this dreaded apparition, which proved to be a young woman, wearing a *white apron*, riding on an *ass!!!* Equally trifling would terrifying objects generally be found, could people only summon sufficient self-command to enable them to examine and discern what at first seemed enveloped in mystery: I say *generally*, because it is sometimes the effect of malice or frolic; *then* I acknowledge they are neither innocent nor trifling, for such a combination of circumstances may be thus produced, that it is almost impossible they can be withstood by the most hardy of their disbelievers. It is but ill-judged mirth, and deserves the most rigid censure, thus to sport with the feelings of our fellow-creatures—those feelings too which are the most subject to alarm, and most violent in their operation. This has sometimes been productive of the worst consequences: we have a living and melancholy instance of it in a person named John Smith, of North Burton, near Bridlington. He was, in his youth, as sprightly and well-informed as the generality of his peasant neighbours and contemporaries, and promised to become a useful member of society, as a husbandman, in which sphere of life he seemed destined to move. On his near approach to manhood, two young women, probably his fellow-servants, feeling themselves disposed for a frolic, determined to make him the butt of it. For this purpose, each wrapped herself in a sheet, and crept beneath a table in expectation of his arrival. They had not been long in this situation, when he came in, on which they quitted their hiding place, and advanced towards him. He no sooner fixed his eyes on them, than he ran out of the house—and never returned in his senses! Doubtless his mind had been tinctured with early prejudices. Instead of being the useful character he might have been, he is now rather a burthen to the parish than otherwise. He is, what is termed, “meated round the town;” that is, he gets his provisions at the *farmers* in weekly rotation, compensating for it in some *manner*, by tending their cattle, and other trifling offices;

and is the sport and ridicule of all the boys in the village. It has been remarked to me, since the publication of your last number, that I have asserted untruths; that there *have* been such things as apparitions, and instanced the ghost of Samuel, raised by the Witch of Endor; that there can be as little doubt of there being such now; and that I disbelieve in them, only because I have never seen any, and cannot comprehend their nature. I acknowledge, that on important occasions, God has sent his spirits on messages to man: such was that of his angel to Manoah, for the delivery of a people; and to Zacharius and the Virgin, for the redemption of mankind; but it is very improbable that He should permit apparitions to appear, for the purpose of restoring to the right owner a piece of land, or a little filthy lucre; nor can it reasonably be supposed, when we have "Moses and the Prophets," that he should send spectres to deter us from sinning.

There can be little doubt but the majority of the nonsensical stories of supernatural noises and church-yard ghosts, arises from the impositions of Knavery upon Folly, or of Folly upon itself: and no one, who believes that the providence of God is over all his works, can suppose that he will disturb the dead merely to frighten the living, or that he will permit phantoms to arise either for no purpose, or none essential to the well-being of his creatures. A man of reflection, who has a proper sense of his duty to God and his neighbour, will **FEAR GOD, AND HAVE NO OTHER FEAR.**

My conceptions of God, I acknowledge, fall infinitely short of His greatness, His goodness, His mercy, His glory, and His power; yet they at the same time reach so high as not to allow a parallel. Turn wherever I will, I see nothing but God: His works are unbounded, *every where* to be found, and *prove* His existence; while, on the contrary, I see no trace of an apparition; it is *not any where* to be found; and, if I may so speak, *disproves its own existence.*

I would, before I conclude, advise those, who, from education, are afraid of these delusive phantoms, to read Bloomfield's beautiful ballad of the Fakenham Ghost, and to endeavour, as much as they possibly can, to shake off *these unmanly and terrific ideas, to which a firm reliance*

on the goodness of the Almighty will materially contribute, who, they must feel assured, will not wantonly terrify or afflict his humble and dependent creatures.

LITERARIUS.

Bridlington, January 9th, 1815.

ON THE MARRIAGES OF THE POOR.

THAT Marriage is honourable, cannot be doubted, since it is asserted in holy writ ; but many causes may operate to make the state more or less happy ; and those who with a little prudent caution and forbearance might have slept on a *bed of roses*, have but too frequently rushed into difficulties, and planted their pillow with *thorns*. Young persons of both sexes, in the lower walks of life, too seldom reflect on their means of subsistence ; they think, if they may be said to think at all on the subject, that matrimony is essential to their happiness, and so they rush into the chain

“ As custom leads the way ;”

not considering that he who marries before he can maintain a wife and family, is a public nuisance, and a pestiferous burden to the community. For, by so doing, he is the cause of bringing into the world human beings, on whom he entails wretchedness ; and who may have reason to curse the parents who caused their existence. Every one, therefore, be his situation in life what it may, is bound by every social and moral duty, before he presumes to enter upon so important and hazardous an engagement as that of matrimony, to ask himself, *seriously*, “ have I sufficient, or have I any probable certainty that I shall have sufficient to support a wife and family ?” If the answer should be in the negative, he ought, without hesitation, to add, “ then I have no business with a wife to run the risk of having a family ; and I shall betray the duty which I owe to my country, if I entail on it the burden of supporting an additional weight of unproductive industry.”—There can be no doubt that

“ Marriage rightly understood,
Gives to the tender and the good,
A paradise below ;”

But then,

“ Let reason teach what passion fain would hide,
That Hymen’s bands by *prudence* must be tied.”

A neighbour of mine, who was a poor but an honest and industrious man, had two sons, both of whom he brought up to trades, that they might “ get an honest living as he had done.”—Tom, the elder, a good looking lad, he bound apprentice to a shoemaker, and Bill, the younger, to a tailor.—Tom, after he had been a few years bound, contrary to his master’s advice, would stroll about the streets, on a Sunday evening, with flirting young women. At length he fancied he was in love ; and it was with difficulty he could be prevailed on to serve his term out before he married. As soon as the nuptials were over, he and his new-made wife began to think of purchasing a little furniture : for it appeared that it never entered into their thoughtless heads, till now, that they would want furniture ; but though they were both very smartly dressed, neither of them had any money, having saved none in servitude, and their parents being poor, they were compelled to get their little furniture on credit : and as they purchased it at a dearer rate on that account, it threw them so far behind hand in the world, that they were never able to redeem themselves ; and, as their family increased, they had no means of procuring their children any learning ; they were brought up in ignorance ; were ragged and dirty ; and a nuisance to the neighbourhood in which they lived.—The parish was oppressed with this thoughtless family, and the woman ended her miserable life in the workhouse.

Bill, whose person was rather ordinary, served out his apprenticeship, and obtained from his master a good character for sobriety, honesty, and industry : this served him as a foundation to build on. After the term of his apprenticeship was ended, he worked at his trade a few years, as a journeyman ; and, being careful, for he never went to a public house, he saved the sum of *forty pounds* ; he then addressed a prudent, modest, servant-maid, about his own age, who had lived several years in the same family ; and whom he had never observed to wear a white gown, or bows on her shoes, and very seldom, except on a

Sunday, white stockings ; for he used to say that he always shunned those fine lasses : " it would take all a poor man's wages to find them with clothes." This honest couple were married, and as they had both saved money, they bought their little furniture without credit ; consequently, got it much cheaper, being enabled to go to the best market. They had then something to spare, with which they began business ; and being industrious, were encouraged by their respectable neighbours. They had it in their power to give their children a little learning ; and as they brought them up with industry, and set them a good example, always taking them to a place of public worship on the Sabbath, they followed the example of their worthy parents, and all turned out well. They lived to a fair old age, saw most of their children settled in the world, and died respected by all who knew them.

Beverley, 1815.

Z.

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*A TRANSLATION
OF THE LATIN ORATION,
No. I. page 29,*

By Mr. E. B. HARRISON, of Hatfield, near Doncaster ;
Mr. YORKE, Guisbrough ; and JUVENIS, Grammar-
School, Hull.

Their translations being similar, we deem it unnecessary to present the Public with more than one.

An Oration

Delivered in the SHELDONIAN THEATRE, OXFORD,
On the 15th day of June, in the year of our Lord 1814.

By WILLIAM CROWE, LL. B.
PUBLIC ORATOR OF THE UNIVERSITY.

Most serene Prince, Vicegerent of our most beloved
Sovercign, and you august Kings, invincible
Commanders, illustrious Strangers,

*Although I should be silent, the circumstance itself
would proclaim with what great joy we are this da-
ffected ; when not only men of all ages and degrees, but*

even the walls themselves and the buildings of the city may be seen to rejoice exceedingly, on account of your most wished for arrival. With great honour and incredible joy, have ye filled this Oxonian Academy, by vouchsafing to favour it with your presence, which is most delectable at this time, when we may not only have it in our power to congratulate you as guests, but also to return the thanks due to our deliverers, since, by your exemplary conduct, we are at length safe, and freed from a very grievous war.

The congress of you, O Kings and Princes most potent, hath shed an unusual and splendid lustre upon these places, as has never before shone upon this or any other Academy. Nevertheless we are not those who think ourselves worthy of such honour, nor am I willing that any thing should be arrogantly spoken or conceived by me: when I call to remembrance so many excellent men, who in this place were renowned for their knowledge in all sciences,—so many Kings and Princes, either founders of our Colleges, or whose minds were formed by our discipline; but before all, that great King Alfred, from whom, O most august Prince! sprung your noble race; and to whose sceptre you are the most lawful heir,—that Alfred whom we venerate as the founder of our University; and whose magnanimity we ought not to conceal. If he were present, he would have the greatest reason to boast of his University; therefore, I beseech you to allow me to act as his representative for a short time, whilst I address you in words adapted to the purpose; and to which you, O Kings! are so attentively listening; therefore, think that he now addresses you.

“ Illustrious guests, I, who am a Prince, have founded this University, which ye behold, and which is the most ancient of any now standing. After I had subdued my most inveterate enemy, (as ye have lately done) I wished not for any thing so devoutly as that I might live in tranquillity in my strengthened kingdom; where the liberal arts and sciences, and the arts of peace, might be cultivated; indeed, I know how much studies of this kind contribute to the honour of the High God, and to the happiness of mankind. I hope also that a work so noble, *began by me, will be carried on, and augmented by other*

men after me, by Kings and by Princes ; then, indeed, a part of that glory would redound to me. Nor does my hope deceive me.—This is that Oxford, whose name has been extended to the farthest nations, and reached the most remote people : in which city being nourished, I have obtained victories as it were by the aid of my soldiers, over much barbarity, ignorance, and impiety. Moreover, I have treasured up many trophies and monuments of learning, which will neither be destroyed by time, nor buried in oblivion."

Thus magnificently would it have become Alfred to have predicted : but we must think and speak more humbly. Most illustrious Strangers, we now request, and also beseech you, that with that condescension with which you came to visit our Academy, you may deign to receive these which we offer, as a tribute of our gratitude, duty, and respect. They are indeed small, but proceed from grateful hearts ; we offer most willingly, what to your just cause we owe, because that settled peace we now enjoy, which is so well adapted to our studies, and which has been so greatly desired by us, has, O august Princes ! to all the nations and people of Europe, by your prudent councils, valiant Generals, admirable virtue, and almost divine fortitude, been effected.

TRANSLATION.

EPITAPH ON ELIZA, The Wife of the Rev. JAS. COX, S. T. P.

Very much lamented ;

Who died on the 16th August, 1812, aged nearly 41 years.

CALMLY you rest, dear wife, 't th' earth's dark womb,
'Till the loud trump shall call thee from the tomb ;
O then with thy pure self if I should rise !
And our right hands be join'd beyond the skies !
But the great Judge's voice if I should fear,
Thy trembling hand extend, Eliza dear :
Wretch that I am—unworthy thee to meet,
Unworthy there thy spotless soul to greet.
Yet oh ! what extacies, might you but there
Resume the station which you bore when here.

Guisborough.

J. YORKE.

The same by JUVENIS, Grammar-School, Hull.

SWEET may you rest in sleep profound,
And calmly slumber in the tomb,
'Till summon'd by the trumpet's sound
To hear your just and righteous doom :
Then may we pledge our mutual love,
And happy reach the skies above :
But if I tremble as I stand,
Conscious of guilt before my God,
Oh ! sweet Eliza, stretch your hand,
And lead me to his blest abode :
Then, my dear partner, you will be
The same in Heav'n to all eternity.

Poetry.

REPORT OF AN ADJUDGED CASE :

A Parody from COWPER.

BETWEEN Lex and Amicus a contest arose,
Gold and Paper had set them unhappily wrong,
And the point in dispute was, as all the world knows,
To which the pre-eminence ought to belong :
So GRUDGE was the Lawyer, and argued the cause
With a great deal of skill, and a wig full of learning ;
While Chief Baron SELF set to balance the Laws,
So famed for his talent in nicely discerning.

“ My Lord,” he exclaimed, “ my case is most clear
As ever was heard in these walls, I protest :
Tho’ something of novelty still it may wear,
‘Tis as old as the sunbeams that set in the West.
These Guineas, so solid, so brilliant to view ;
Nor canker’d by rust, nor demolish’d by time ;
What would they not purchase for me, or for you ?
Ease at home, or enjoyments in some foreign clime.”

He harangued, till his eloquence border’d on rage,
To prove what no mortal could fairly deny :
He sneer’d at the Bank, he inveigh’d at the age,
And compared a Bank Note to the wings of a fly.

“ Then surely, my Lord, all the Court must agree
 That this precious coin ranks exclusively high ;
 Intrinsic in value it ever will be,
 Whilst nominal properties lessen and die.”

Then, shifting his side, as a Lawyer knows how,
 He pleaded for Paper, with pathos and grace ;
 And clear as a streamlet his language did flow
 To prove how our Bullion to Paper gave place.
 He argued on politics, consuls, and trade ;
 Recounting the services Paper supply'd ;
 Talk'd of credit, convenience, revenues paid ;
 And at depreciation most loudly decry'd.

But ah ! to the shame of a Court so uncouth,
 His intelligent reasoning no light could unfold,
 Which he wisely perceiving, returned to the truth,
 And redoubled his efforts for Silver and Gold.
 So the Judge, in a tone most decisive and clear,
 Decreed, (with the welfare of Judges at heart,)
 That as long as a Guinea enlightened our sphere,
 The Paper should hold a subordinate part.

Hull.

ARBITER.

—
TRIBUTARY STANZAS,

ADDRESSED TO THE GOOD MAN OF THE HILL :

See Visitor. No. IV. page 152.

ACCEPT this tribute from a friend
 Whose powers to please are small,
 Unless fair Charity attend,
 They may be none at all.

The pleasures that his mind receives
 From all thy works of art,
 But ill accord with what he gives
 To prove a grateful heart.

I've seen thy native powers display'd
 Beyond the common line ;
 Nature, in beauteous tints portray'd,
 Through all thy portraits shine :—

Unnumber'd tribes of mingled hues,
 Each plant, each fragrant flower
 That hangs its head in morning dews,
 And sports its little hour:—

The varied race of songsters gay,
 That sport on active wing,
 To hail the Summer's bounteous ray,
 Or cheer the days of Spring:—

Insects, in gaudeous colours drest,
 With beasts that walk the plain,
 Or in the sheltering cottage rest;
 And fish that swim the main:—

Imbedded deep in many a cave,
 Where thousand wonders lie,
 Bright shells that ocean's billows lave,
 Have caught thy curious eye:—

Each element to thee can bring
 New wonders to delight;
 And from thy tasteful pencil spring,
 Their forms to greet our sight.

Here, on thy wild and desert hill,
 Where blows the mountain gale;
 Where, from the scanty soil, the rill
 Runs murmuring to the vale;

Where first the morning's slanting beams
 Upon thy cottage rest,
 And evening throws her golden gleams,
 Upon the mountain's breast.

Remote from all the busy strife
 Of population's tide,
 The peaceful labours of thy life
 In gentle currents glide.

Happy, if to some favorite art,
 Some toil congenial given,
 Thy head, thy hand, can bear their part,
 To scan the works of Heaven.

How blest thy lot ! whilst thousands toil
 With care and ceaseless pain,
 'Cross trackless seas, or delve the soil,
 For competence, in vain ;—

Thy humbler fate may daily prove
 How little can suffice
 For competence and social love,
 If haughty man were wise.

Nature, and Nature's volume wide,
 Expands to every mind,
 But ah ! how small to letter'd pride.
 Its prospects are confin'd !—

Whilst thine by nature only taught,
 Can range from clime to clime,
 Explore new works with wonder fraught,
 And pluck the wings of time ;

Though hidden from the gazing eye,
 And to the world unknown,
 Thy modest worth and virtues lie,
 Thou art not left alone :—

Heaven owns thee as her favor'd child,
 Thy genius wings its flight,
 High as the soaring eagle wild,
 Basks in ethereal light :—

Few, few can boast alike with thee,
 Such gifts, such powers combin'd,
 Such genius in obscurity,
 So good, so calm a mind :

Still may these varied powers engage,
 And form thy best delight ;
 'Till strength decay, or drooping age
 Bring on thy winter's night.

Now let thy charity excuse
 The faint unstudied lay
 A wandering stranger's lonely muse
 Would to thy merits pay.

Though various cares engage his breast,
 And all his fancy fill,
 Full oft on thee his thoughts shall rest,
 " The good Man of the Hill."

THE WILDERNESS.

FOREST scenery has always, to the admirers of natural beauty, a peculiar interest; for it is there that nature seems most to expand, and to exhibit herself in all her native freedom.—Rising into majestically swelling hills, or stretching forth her extensive plains, she is no longer contracted, but affords to the contemplative mind, new proofs (if any were wanting) of order, harmony, and beauty, in the structure and the disposition of the universe.—Magnificent as is every design of creative wisdom, it is here more sublimely grand, and creates in the mind that silent awe and that solemn feeling of reverential devotion, which are so happily calculated to lead us from “Nature, up to Nature’s God.” Trees of enormous growth, whose rude and rugged trunks have out-braved the tempestuous winds of Heaven, and whose tops have escaped the destructive glance of the electric fire, present to the wearied traveller in the mid-day heat, a cooling shelter and a refreshing shade. Long level plains, watered by meandering springs, or visited by the dews of Heaven, afford sustenance to flocks and herds, and yield an herbage both rich and plenteous to their wandering tenants; whilst many an opening through the woods, or an elevation from the plains, affords to the passenger the cheering prospect of farms and towns abounding in plenty, and marked in the distance as the resort of industry and opulence, by glittering spires, and whitened mansions peeping through the woods. Such pictures can scarcely deserve the name of a “Wilderness,” and it was not without an involuntary emotion at its impropriety that I found the title applied to a place so called, in the Forest of Dean, near Gloucester.

Rising above the small town of Mitchel Dean, is situated this singular spot, and it is scarcely possible to conceive any thing more grand and pleasing. The hill is finely wooded to the very summit, and requires some exertion to ascend its lofty side; but the eminence once gained, every labour is amply repaid.—All below rests in a perfect miniature, and every view round the extended horizon is full of beauties, varied in every combination that fancy can suggest or nature display. Woods, waters, hills, mountains, rocks, cliffs, and winding roads, are to be seen in every perspective, from the broad foreground, to the contracted, and fading lines of distance; interspersed with villages, orchards, villas, towers, and spires, and every indication of a rich, populous, and fertile country.

In the valley, to the right, the copious Severn rolls his tributary waters into the bosom of his parent sea ; and spreads his meandering course through a beautiful vale, winding and revolving, glistening and sparkling through the embosoming woods like the folds of the twisted snake, as he writhes his shining form beneath the sunny beam. An amphitheatre of hills encircles the sinuous course of the river, and serves to diversify the prospect by their varied elevations, their gentle undulations, the rude appearance of their craggy sides, or the smooth and cultured aspects of woods, whose summits seem to touch the clouds. To the left, the mountains of health-inspiring Malvern, rise majestically on the sight, gradually receding, till they are lost in the deep blue azure of the horizon : all between is fertility and beauty, combined to the most luxuriant extent ; and forming a picture inimitably pleasing and diversified.

The back ground is bounded by the huge mountains of Wales ; mountain behind mountain, hill behind hill, in every shade and distance ; from dark to gloomy, from gloomy to grey ; and from grey to the mellow tints of the evening sky, when the sun has sunk behind their enormous elevations.

To such a picture, who could give the name of a "Wilderness," I am at a loss to conjecture ; and I was justified when I apostrophized the stranger, who, like me, has visited, and been enraptured with this picturesque retreat, in saying,

THIS IS NOT A WILDERNESS.

STRANGER ! if thy vagrant feet
Tread the path to this retreat,
Where the wide expanse of hills,
Thy curious eye with wonder fills,—

Where the Severn's waters flow
In wide meanders smooth and slow,
The gloomy forest's deep'ning shades,
Shoot across the length'ned glades ;—

Where the oak, in hoary age,
Long has braved the tempest's rage,
And the pine in darkest green,
Adds new beauties to the scene :—

Wide the fields and vallies smile,
And mountains rise, an awful pile !
Rocks, trees, and spires, and hamlets gay,
Catch the moonlight's soften'd ray :—

Where the ev'ning's setting beam,
Gilds old Severn's winding stream ;
And the morning's op'ning hue,
Shews the mountain's distant blue :—

Where the birds in concert sing,
To hail the glad return of spring ;
The blackbird's song, the woodlark's note,
Along the vallies sweetly float :—

If these scenes and sounds combin'd,
Charm thy ear, and please thy mind,
Stranger ! surely thou'l confess
This is **NOT** a Wilderness.

Pause then, Stranger, and discern
Some moral for thy heart to learn ;
Ere thou leav'st this green retreat,
Let its scenes these hints repeat :

Wide as the hills and vales combin'd,
May useful knowledge swell thy mind,
Clear as the Severn's ample stream,
Mild as the ev'ning's setting beam ;—

Strong as the oak, whose sturdy form
Has brav'd the lightning and the storm ;
Thus may thy soul, in virtue strong,
The sinking years of life prolong :—

And, as glad nature lifts her voice,
When hills and vales, and groves rejoice,
When winds and waves, and tempests raise
One universal song of praise.

Then, Stranger, if thy voice incline
To swell this harmony divine,
Oh ! let thy grateful heart confess
That this is not a "*Wilderness.*"

Answers to Queries.

(46) *Answered by Mr. BENJ. FARROW, Hull.*

FROM the following reasons, I consider light to be immoveable :

1. If the sun be considered as the fountain or source whence light and heat proceed, surely during the revolving ages which have elapsed, the sun must have become extinct, as no provision seems to be made for the rays returning to their original source.

2. As there must, in nature, be some fixed foundation for all the moveable existences of the universe, and as we are well assured that neither earth, water, nor air, constitutes this fixed foundation, there exists nothing, to our knowledge, except light, which can form this immoveable basis of moveable nature.

3. The established principles of motion and locality sufficiently answer the arguments deduced from Jupiter's satellites ; consequently they cannot be considered as reasons against the arguments which I have advanced.

The same by Mr. LAMPLUGH, Walkington.

THAT light is moveable needs no demonstration ; since our greatest philosophers agree, even in its velocity ; and state its motion to be 897,600,000 feet, per second. If light has mobility, it must have materiality ; for *nothing* can neither move, act, change, be changed, or acted upon : if light be not material, how can the shadow of a body be accounted for ? But all the properties of light tend to prove its materiality : the angle of incidence being always equal to the angle of reflection. Light always passes or moves in straight lines, in one and the same medium ; and refracts, when passing out of one medium into another, in proportion as the density of the medium entered is to that through which it has passed.

Vision is not an active, but a passive attribute : every object must be acted upon by light before that object is *visible*. Dr. Boerhaave caused a globe of iron, twelve inches diameter, to be heated red hot, and suspended at the end of a very exact balance, and counterpoised by weights at each end, very accurately ; and, by gathering

the rays of the sun's light into a focus, it actually moved the machine.

Of this opinion are *Messrs. Baines, Page, and Waterland*; but *Mr. Osmond* coincides with *Mr. Farrow*.

(47) *Answered by Mr. W. ROBINSON, Guisborough.*

If a glow-worm be taken or disturbed, whilst shining with great splendour, its light will presently become faint, and in a short time will vanish. From this circumstance, probable conjecture urges me to assert that the light, emitted by the glow-worm, is produced by electricity: by the friction of the joints of its body (which are eleven in number) against each other. Numerous experiments already made are sufficient to convince us that a portion of electric fluid exists in a greater or less degree in every being in the scale of animated nature; but for what purpose this animal is supplied with such abundance, we must be compelled to acknowledge our ignorance, until we are better acquainted with its history.—No doubt its creator endowed it with this wonderful property for the best and wisest of purposes.

The same by Mr. PAGE, Westwood-Cottage.

IT is well known that the glow-worm and some other insects, contain a portion of phosphorus; but of such a nature that the particles of light which it produces have so small a degree of velocity, as to cause little or no heat. If the velocity of the particles of light which the phosphorus of the glow-worm produces, were of such a degree as to cause heat, then the glow-worm would appear lucid in the day time; but the difference of comparison between the velocity of the particles of light of the sun, and the velocity of the particles of light of the phosphorus of the glow-worm is so great, that the glow-worm only begins to appear lucid when the rays of the sun are barred from us.

Messrs. Baines and Waterland also favoured us with answers.

(48) *Answered by Mr. WATERLAND.*

WHEN a candle is burning, the tallow, after being melted, is drawn up into the wick by capillary attraction; it is there converted, by the heat, into an empyreumatic

oil ; and then burnt or consumed. A small quantity of this oil being contained in the wick, after the candle is blown out, emits a very unpleasant odour ; which together with the hydrogen gas, disengaged by the slow combustion, which goes on for some time in the wick, after the candle is blown out, causes the disagreeable smell mentioned in the query. The combustion of the hydrogen gas, which is disengaged while the candle is burning, forming what is called the flame of the candle, volatilizes and consumes the empyreumatic oil as it is formed ; and thus prevents the candle from emitting any considerable smell, while burning.

The same by Mr. RAINES, Reading.

THE operation of melting tallow, except that of burning candle, is always attended with a disagreeable smell. In this single instance, the flame of the candle regularly consumes the melted grease, the oxygen gas contained in the surrounding atmospheric air is absorbed to support the combustion, and is therefore prevented from entering into combination with the melted tallow, and producing an offensive smell ; but when the candle is blown out, this obstacle is removed, and a disagreeable smell is emitted as long as any tallow remains in a state of fluidity.

(49) *To this query no satisfactory answer has been received.*

(50) *Answered by Mr. LAMPLUGH, and Mr. PAGE.*

OSIRIS, King of Egypt, was a wise, discreet, and virtuous prince, and very much beloved by his subjects ; but men's graces oft prove their greatest foes :—

“ Base envy withers at another's joy,

“ And hates that excellence it cannot reach.”

Typhon, his brother, hated him for his goodness, envied him for his greatness, and entered into a conspiracy to kill him. He privately obtained the measure of him, to which he got a magnificent coffin made. It was taken home at the time he was entertaining his friends. The guests admired it, and Typhon told them jestingly that the person whom it would fit should have it. Several tried, but to no purpose, till Osiris went into it ; which he had no sooner done, than they closed the coffin, and threw him

into the sea. The *Pans* and *Satyrs*, hearing of it, told it to the people, who were seized by that sudden consternation, which has ever since borne the name of "panic fear."

(51) *Answered by Mr. BAINES.*

"UNQUALIFIED" signifies unfit or improper, and "approbation" the approving of a thing; therefore, "unqualified approbation," must mean an improper manner of the speaker or writer's approving of the thing he is mentioning.

The same by Mr. WATERLAND.

THE meaning of the word unqualified, is unfit, improper, &c. and is therefore improperly used along with the word approbation. I suppose the meaning that is intended to be conveyed by it, in the phrase mentioned in the query, would be better expressed by the words unconditional, absolute, &c.

(52) *Answered by Mr. WATERLAND.*

THOSE cobwebs are the work of the field spiders, which nature hath amply endowed with powers for such a performance. They are furnished with fine tubercles, or teats, at the extremity of the belly, whose orifices they can dilate or contract at pleasure. It is through these orifices that they spin a gluy substance, of which they contain a large quantity within their bodies. They sometimes apply those tubercles to any substance, and then spin out a thread as they recede from it. At other times they are observed to dart out a long thread with that violence and stream, with which water spouts out of a jet; this thread, taken by the wind, is sometimes carried to several fathoms in length, still issuing out of the body of the animal; when, if it meets with any substance, it adheres to it by that glutinous quality; and the spider fastening the other end, the thread is secured. It is in this manner that these cobwebs, or threads, across lanes are formed, as noticed in the query.

The same by Messrs. LAMPLUGH and PAGE.

THOSE who have read the history of silk-worms and spiders, will not be surprised to see the cobwebs mentioned in the query.

It is well known, that spiders have the power of spinning their lines to a considerable length, in a little time; and after fastening them to a fence, they proceed to another; then tighten their lines across the lane. A great number of spiders thus occupied, would soon produce the phenomenon in question.

The same by Mr. YORKE, Guisbrough.

THE long white cobwebs, which are perceived in calm sunny weather, extended from every hedge in vast quantities, are called *Gossamer*, and were formerly thought to be the down of plants. *Massy*, however, has found them to be deposited by a small field spider, a very minute animal, the lightness of whose body enables it to ascend into the air to a considerable height. Since the discovery, this insect has acquired the name of the *Gossamer* spider.

Mr. Baines also answered this query.

(53) *Answered by Mr. WATERLAND.*

THIS is owing to the base of the potash having a stronger affinity for oxygen, at a high temperature, than the red lead; part of which, having its oxygen attracted from it by the potash, is reduced to a metallic state.

Grammatical and Philosophical Queries.

(54) *By Mr. WATERLAND.*

IF, according to Newton's hypothesis, light be matter; what becomes of it after it is thrown off from luminous bodies?

(55) *By Mr. OSMOND, Withernsea.*

IT has been said, and generally believed, that willows will only grow where there is a continual wetness, or moisture, as in low watery grounds. There is now a willow growing on the top of the exceedingly high and hard Wold of Thipendale, in the East Riding of Yorkshire, which was planted there in the year 1810; and is now ten feet in height. How does this willow obtain its continual wetness and moisture?

(56) *By ISHMAEL, Hull.*

WHY is the wind colder when it blows from the North, North-East, and East, than when it blows from the South, South-West, and West?

(57) *By Mr. LAMPLUGH.*

IT is asserted that spring water is warmer when the weather is frosty, than when it is open: if so, required the cause.

(58) *By Mr. BAINES, Jun. Reading.*

I HAVE frequently observed the same piece of silk, when viewed in different positions, appear of different colours to the eye: required the reason of this.

(59) *By EBORACENSIS.*

WOULD not the orthography of the word *Committe*, with one *e* final, be more agreeable to derivation, as well as to the analogy of the English language?

(60) *By Mr. ATKINSON, Heskett School.*

REQUIRED the origin of the old saw, "as poor as a rat."

(61) *By Mr. ENGLAND, Normanby School.*

How is that sensation to be accounted for, called edging the teeth?

**Answers to Mathematical Problems.**(84) *Answered by Mr. YOULE, Sheffield.*

ASSUME $x^2 - y = x - r^2$; whence $y = 2rx - r^2$; and $x^2 - 3y = x^2 - 6rx + 3r^2 = \square = x - rm^2$; $\therefore x = rm^2 - 3r + 2m - 6 = 13 \div 2$, taking $r = 1$, and $m = 4$; $\therefore y = 12$.

The same by Mr. BURDON, Acaster Malbis.

Put $x^2 - y = a^2$, and $x^2 - 3y = b^2$; then $x^2 - a^2 = y$, and $x^2 - b^2 = 3y$, which, resolved into their factors,

are $x + a \times x - a = y$, and $x + b \times x - b = y \times 3$. Assume $x + a = m$, and $x - a = y \div m$, also $x + b = y \div n$, and $x - b = 3n$; the sum of the two former equations is $2x = m + y \div m$, and of the latter $2x = y \div n + 3n$; $\therefore y = \frac{3n - m}{n - m} \times mn$; conseq. $x = (3n^2 - m^2) \div (2n - 2m)$. If $m = 1$, and $n = 2$; then $x = 11 \div 2$, and $y = 10$; therefore the squares are $(9 \div 2)^2$, and $(1 \div 2)^2$.

Also by *Messrs. Ambler, Baines, Chapman, Darby, England, Gawthorp, Harrison, Jackson, Killingbeck, J. Lamplugh, M. Lamplugh, G. Leng, Maffett, Mair, Page, Smith, Tindall, Treby, Wiseman, and Yorke.*

(85) *Answered by Messrs. Chapman, Darby, and Killingbeck.*

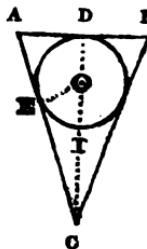
The two eq. transposed, &c. are $x^2 + xy = 65$, and $y^2 - xy = -10\frac{1}{2}$; $\therefore x^2 + y^2 = 54\frac{1}{2}$. In the sec. eq. $x = (y^2 + 10\frac{1}{2}) \div y$; whence, by substitution, $(y^2 + 10\frac{1}{2}) \div y^2 + y^2 = 54\frac{1}{2}$, a quadratic; hence, $y = 3\frac{1}{2}$, and $x = 6\frac{1}{2}$.

Also by *Messrs. Ambler, Baines, Chapman, jun. England, Gawthorp, Harrison, Jackson, J. Lamplugh, M. Lamplugh, G. Leng, Mair, Page, J. Tadman, Smith, Wilkinson, Wiseman, Yorke, and Youle.*

(86) *Answered by Mr. Gibson, Normanby School; and Mr. Smith, St. Andrew's-Gate, York.*

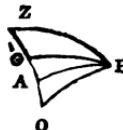
LET $x = CI$; then $CD = x + 2$, and $CE = \sqrt{x^2 + 2x} (CE^2 : 1 (EO^2) :: x + 2 (CD)^2 : x + 2 \div \sqrt{x^2 + 2x} = AD)$; hence, per prob. $x + 2)^2 \div x^2 + 2x \times 3.1416 \times x + 2 + 3 = 2 \times .5236 \times 8$; whence, $x = 2$; $\therefore CD = 4$; and $AB = 2\sqrt{2}$.

Also by *Messrs. Ambler, Baines, Chapman, jun. Darby, Gawthorp, Harrison, Jackson, Killingbeck, M. Lamplugh, G. Leng, Maffett, Mair, Page, J. Tadman, Tindall, Wilkinson, Wiseman, Yorke, and Youle.*



(87) *Answered by Messrs. G. LENG, Hull, and J. YORKE, Guisbrough.*

In the annexed fig. $\hat{O}P = OP = 67^\circ 22'$
polar dist. draw $AP \perp$ to $O\hat{O}$; then, in the
rt. angled spherical triangle $A\hat{O}P$, are given



$\hat{A}O = 25^\circ$ (half the diff. of the alts.) and $\hat{O}P$ to find $AP = 64^\circ 52' 26''$. Again, in the spherical triangle ZAP , right angled at A, are given $ZA = 40^\circ$, and AP , to find $ZP = 71^\circ 1' 5''$; \therefore lat. was $18^\circ 58' 55''$, and the times $7^h 21' 59''$, and $10^h 57' 42''$.

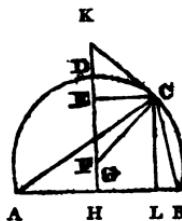
Also by *Messrs. Baines, Burdon, Chapman, Darby, Gawthorp, Harrison, Jackson, Mair, Wiseman, and Youle.*

The Rev. T. P. IRVIN, after giving a solution similar to the above, adds—As some of your readers may not be acquainted with *the projection of the sphere*; yet would wish to understand how the sun can be upon the same azimuth twice in the course of one forenoon, I shall simply direct how a common globe may be used to convey that idea: elevate the pole to the latitude of $18^\circ 58' 55''$; fix the quadrant of altitude to the zenith; find the sun's place in the ecliptic, for the given day (June 6th); cause the same to coincide with the quadrant of alt. at 25° ; then turn the globe Westward, the quadrant of alt. remaining stationary, and the sun's place will again cut it at 75° .

Sir ISAAC NEWTON, &c. observe that in the *torrid zone*, whilst the sun is between the parallel of the place and the tropic nearest to it, the shadow goes back twice, repeating the directions to the same points, once in the forenoon, and once in the afternoon: and the sun will then seem to go back. They then infer that it is *no miracle* that shadows go back on dials, except they go back suddenly; or if they point back to the same hour-lines, if the style is not perpendicular, but parallel to the poles.

(88) Answered by Mr. BURDON, *Acaster Malbis.*

Cons. Upon the given base AB , describe the segt. of the circle (the centre of which is F) to contain the given vertical angle. Bisect FH in G , and produce GF to E , making (by problem 6, Simpson's Select. Ex.) $GF + FE \cdot FE = FD^2 \div 2$.



Draw EC parallel to AB , cutting the circle in C ; join AC , CB , and ACB will be the required triangle.

Dem. Draw $CK \perp$ to FC meeting FD produced in K . By const. $GF + FE \cdot FE = FC^2 \div 2$; $\therefore 2GF + 2FE : FC :: FC : FE$: (by sim. tri.) $FK : FC$; hence $2GF + 2FE = FK = EK + FE$; or $2GE + FE = EK$, and $HE = EK$. Therefore by the scho. to Theo. 8. Simpson on the *max.* and *min.* of Geom. quantities the inscribed rect. $ECLH$ is a *max.*; consequently $AL - LB \times LC$ is a *maximum*. Q. E. D.

We regret that want of room prevents the appearance of the solutions to this problem received from *Messrs. Killingbeck, Lamplugh, Page, and Wiseman.*

The same by Mr. BAINES, Reading; Mr. ENGLAND, Normanby; and Mr. HARRISON, Burton-Pidsea.

LET $HD = a$, diam. of the circle $= a + b$, $HE = CL = x$, then $ED = a - x$, and by the prop. of the circle $\sqrt{a - x \times b + x} = EC$; and, per prob. $HE \times EC = x \sqrt{a - x \times b + x} = a \text{ max. which put into fluxions, and reduced, gives } x = \frac{1}{8}(\sqrt{9a^2 + 14ab + 9b^2} + 3a - 3b)$.

(89) Answered by Mr. BAINES, *Reading*; Mr. GAWTHORP, *Leeds*; and Mr. WISEMAN, *Hull*.

LET x and $\sqrt{1 - x^2}$ = sine and cosine of latitude; y and $\sqrt{1 - y^2}$ = sine and cosine of declination; $a = \cos.$ of $82^\circ 30'$ ($5\frac{1}{2}$ hours in degrees); $b = \sin.$ of $19^\circ 30'$; and $c = \sin.$ of $30^\circ 30'$. Then, as $1 : x :: c : y = cx$.

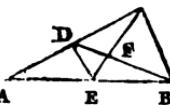
Again, vide Emerson's Trig. B. 3. P. 38, $\sqrt{1 - x^2} \times \sqrt{1 - y^2} \times a + xy = b$. Substitute the value of y in this equation, and $b - cx^2 \div \sqrt{1 - x^2} \times \sqrt{1 - c^2} x^2 = a$. Whence $x = .6964666$, the sine of $44^\circ 8' 39''$ the lat. of the place, and $cx = .3534836$, the sine of $20^\circ 42'$, the sun's declination, answering to the 22d of May, or 20th July.

Also by *Messrs. Darby, Harrison, Mair, Yorke, and Youle.*

(90) Answered by Mr. AMBLER, *Eaton Bishop, Herefordshire*, and Mr. BURDON, *Acaster Malbis.*

C

LET ABC be any given plane triangle. Bisect AC in D, and AB in E; join BD, CE, DE, and the triangles DFE, EFB, ADE, and FCB, or DFE, DFC, ADE, and FCB will be in arithmetical proportion.



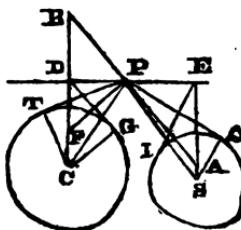
Demons. As F is the centre of gravity of the triangle ACB, $FC = 2 FE$; theref. the tri. DFC = 2 DFE, and FCB = 2 EFB; and, reasoning in the same manner. FEB = 2 DFE; hence EFB = DFC, and FCB = 4 DFE. Again, because CD = AD, the $\triangle ADE = CDE = DFC + DFE = 3DFE$. Consequently the triangles DFE, EFB (= DFC), ADE, and FCB are as the numbers 1, 2, 3, 4, which are in arithmetical proportion. Q. E. D.

Much in the same manner was this problem answered by *Mr. Wiseman.*

Ingenious answers were also received from *Messrs. Baines, Gauthorp, Harrison, M. Lamplugh, Mair, Page, Whitley, Yorke, and Youle.*

(91) Answered by Mr. WHITLEY, *Rotherham.*

Construction. From the centres O, S, of the two given circles, demit, on the straight line DE, given in position, the perpendiculars OD, SE; and, having drawn from the points E, D, tangents to the circles, set off EA along ES, and DB along DO, produced, respectively equal to these tangents; then draw AB, cutting DE in the required point P.



New Mathematical Problems.

(96) *By Mr. DARBY, Land-Surveyor, Sutton.*

A good old man, and Kate his wife,
Have smok'd through forty years of life;
And twice twelve ounces smok'd away,
To each succeeding seventh day.
For ev'ry ounce, (devoid of shame,) $12 \times 2 = 24$
Twelve farthings paid the good old dame:
Then, dearest gents, declare, I pray,
What is the sum they've smok'd away. (a)

(97) *By Mr. ENGLAND, Normanby School.*

Given $2y^3$ plus $\frac{y^2}{2} - 2xy = 2x^2$ plus 16, and $\frac{x^2}{y}$ plus $x = y^2 - 1$, to find x and y by a quadratic.

(98) *By Mr. W. TODD, jun. Houghton, near Market Weighton.*

A gentleman has a garden in the form of an octagon, the sum of the sides, in chains, is equal to the number of square chains it contains: required the area of the garden.

(99) *By Mr. HENDRY, Hull.*

AN estate has been offered on lease for 60 years, at £350 per annum; but the offer being rejected, a proposal was made to let it for the same term of years, on condition of receiving £300 per annum for the first 20 years, £350 for the second 20, and £400 for the third 20. What is the difference between the values of these two offers?

(100) *By Mr. G. LENG, Teacher of the Mathematics, Hull.*

PROVE Hill's rule for extracting the cube root:
"The cube of your first period take, &c."

(101) *By Mr. KILLINGBECK, Barton-le-Willows.*

BEING employed to survey a rectangular piece of land, I found that the difference of the length and breadth was

(a) Supposing ready money paid weekly; and allowing 5 per cent. per annum, compound interest.

three times the difference of the diagonal and length ; and the content of its inscribed ellipsis = 392.7 square chains : the dimensions of the field are required ?

(102) *By Mr. SMITH, St. Andrewgate, York.*

GIVEN the distance (m) between two lighted candles, the larger of which diffuses n times as much light as the less, to determine the place between them, where it is the darkest possible.

(103) *By Mr. WHITLEY, Rotherham.*

LOOKING at my watch between 2 and 3 o'clock, I observed that a line, connecting the extremities of the hour and minute hands, was perpendicular to the former. What was the time, the ratio of the hands being as 4 to 5 ?

(104) *By Mr. BURDON, Acaster Malbis.*

THE sides of a trapezium, inscribed in a circle, are in arithmetical progression, the common difference of which is 42, and its area 60. Required the sides of the trapezium, and the diameter of its circumscribing circle.

(105) *By Mr. WISEMAN, Hull.*

THE solidity of a sphere, circumscribed cylinder, and circumscribed equilateral cone, are as the numbers, 4, 6, and 9 : required the proof.

(106) *By Mr. BAINES, Reading.*

THE form of England is nearly triangular ; the three angular points are Berwick, lat. $55^{\circ} 48'$ N. long. $2^{\circ} 6'$ W., Dover, lat. $51^{\circ} 8'$ N. long. $1^{\circ} 19'$ E., and the Land's End, lat. $50^{\circ} 4'$ N., and long. $5^{\circ} 42'$ W. It is required to find the centre of England, i. e. a point equally distant from the three angular points ; also its lat. and long. and the name of the place.

(107) *By Mr. LAMPLUGH, Walkington.*

The area of any right angled triangle is equal to the square root of the products of the areas of the inscribed and circumscribed circles, divided by 3.1416, plus the area of the inscribed circle, divided by 3.1416. Required demonstration.

(108) *By Solomon Lob.*

A whimsical Wight,
Who takes great delight,
Men of science to puzzle and fix ;
A square pond will place,
His window to face,
It's diag'nal, feet nine times six.

The window his eye,
Is twice six feet high,
'bove the pond ; which there must appear
A rhombus to view,
And, as one to two,
The diag'nals must be quite clear.

To finish this job,
He's pitched on poor Lob,
Who's afraid 'tis too much for his pate ;
So VISITORS bland,
Your help I demand,
The fish-pond's position to state.

ANECDOTE ON AFFECTED LEARNING.

"A little learning is a dangerous thing." POPE.

A SPRUCE young gentleman was one day boasting that he had the most happy genius in the world. "Every thing to me," said he "is easy. People call Euclid's Elements a hard book ; but I got through it yesterday from beginning to end in a piece of the afternoon, between dinner time and tea time." "Read all Euclid," interrogated a gentleman present, "in one afternoon ! how was that possible ?" "Upon my honour I did, and never read smoother reading in my life."—"Did you master all the demonstrations, and solve all the problems ?"—"Demonstrations and problems ! I suppose you mean the *as*, and *bs*, and *cs*, the *1s*, *2s*, and *3s*, and the pictures of *scratches* and *scrawls*. No, no : I skipt all *them*. I only *read Euclid* himself, and all *Euclid* I did *read* in one afternoon."

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“**DELECTANDO PARITERQUE MONENDO.**”

HORACE.

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JUNE, 1815.

Vol. II.

**ESSAY ON THE UTILITY OF MATHEMATICAL
LEARNING.**

THAT the study of the SCIENCES is *honourable*, will be readily granted by every one possessed of rational faculties, and the means of directing them to useful or laudable pursuits. Honourable it must appear to all who have learnt to set a due estimation on intellectual attainments, as they contribute to the true glory and dignity of man.— The splendour of birth, and the pageantry of wealth, may be our legal possessions, but in a moral or a meritorious point of view, they can scarcely be called our own; whilst the treasures of a well-stored mind are our natural and unalienable property, that not only enrich and dignify the owner, but, like a common source of light, shed beams on all around him. For the truth of these observations, I appeal to those valuable monuments of wisdom, whether of ancient or modern times, that have not only immortalized their founders, but have enlightened, and will continue to enlighten mankind, till time shall no longer admit of change. And though virtue's intrinsic worth can neither be augmented nor impaired by adventitious circumstances, yet by the liberal arts alone can her true charms be elicited, and displayed in their pure and genuine lustre.— How *delightful* is this employment of the mind in liberal studies, they alone can tell whose souls have felt the true relish of intellectual pleasure: since of all things that can

yield present enjoyment to man, next to the practice of religion and virtue, scientific speculations furnish the most exquisite feast, and, at the same time, leave the most permanent zest behind them. As to the *utility* of these studies, or rather of the sciences to which they are directed, they present us with so wide a field to expatiate in, that we can hardly tell where to begin the interesting excursion. Suffice it for my present purpose to observe, that to the liberal arts we are indebted for all the external comforts and conveniences of civilized life; as well as for the higher pleasures and advantages of mental improvement, and refinement of manners. Deriving mutual aid from each other, they lead to every excellence which the author of wisdom designed for us, or that human nature can enjoy. Like the strings of the lyre, or the keystones of an arch, they constitute a structure of harmony, or of fair proportion; and by their aggregate strength and concord, contribute alike to the glory, the delight, and the benefit of human kind.

Of the sciences which thus adorn, delight and profit us, those do not produce the least share of these happy effects, which fall under the peculiar province of the Mathematics; the utility of which constitutes the principal subject of this essay. And if, reasoning from the wants of mankind, the antiquity of any art or science afford us any general argument of its utility, as I presume it may, then may the Mathematical Sciences claim this advantage, in a most eminent degree. If we may believe Josephus, they were the first that excited, and therefore the first that required the attention of men. He represents that Cain was the original inventor of weights and measures, the builder of the first city, and the first that divided the common property of the earth by inclosures or landmarks. Jubal was the inventor of the harp, and Tubal Cain discovered the method of manufacturing iron and brass; but the Sons of Seth were *the first who employed their attention upon the motions, courses, and revolutions of the sun, moon, stars, and other constellations and heavenly bodies*. So that *the science of Astronomy had its origin before the deluge*. *The first postdiluvians that applied themselves to Mathematical studies, as Josephus and other ancient authors inform us, were the Assyrians and Chaldeans, from whom*

they were brought to the Egyptians by Abraham, who taught them Arithmetic and Astronomy; and long before this period, no little skill in Geometry must have been displayed in the building of Babel.

But not to insist longer on the antiquity of these sciences, I shall proceed to more direct arguments of their utility, drawn from the nature of the thing itself, the experience of mankind, and the effects of the progress of these arts, as they appear in the present refined state of human knowledge. In attempting to do this, I feel considerable anxiety, as well from the importance of such a task, as from the inadequacy of those abilities with which it is undertaken. However, that I may pay some regard to method, I shall endeavour to point out the advantages of the Mathematics as they respect the individual, and as they respect society, or the general good of the species. I begin with the individual benefit derived from these sciences, because they must first have profited and delighted individuals, before they could be applied to the benefit of mankind at large.

The utility of the Mathematical Sciences, as they respect the individual, may be comprised under these two heads:—*first*, they excite attention and diligence, and give the mind a habit of clear and demonstrative reasoning: and, *secondly*, they free the mind from prejudice, error, and superstition.

1. It will, I presume, be readily acknowledged that whatever science engross the attention of man, truth is the grand end of all his enquiries. The highest faculty of his nature is most profitably employed in the search, or the contemplation, of this delightful object. Yet whether from want of impartial diligence in the search, or from the near resemblance that error frequently bears to truth, or the absolute impossibility in many instances of attaining to the knowledge of it; we are often left to wander in the mazes of error and obscurity, or at the best, to take for our guide some plausible probability, some favourite hypothesis of a bewildered mind or a bold imagination. Such was the Epicurean philosophy relating to the origin of the world; such the various tenets of the sects of old.

who differed with endless contradiction as to the supreme good of man; and such the Cartesian philosophy in more modern times, which, rejecting the aid of Geometry, exhibited a crude system of accumulated blunders. No wonder then if the Mathematics are so admirably calculated to elicit the attention of the human mind, by furnishing, in all its operations, a perpetual succession of pleasing and infallible truths. For next to physical certainty, or that which is obvious to the senses, there is nothing that can bring so high a degree of evidence in human reasonings as the truths of Mathematics. And even in other sciences, where our conclusions make the nearest approximation to certainty, our arguments are generally conducted by the principles and axioms of mathematical analysis or demonstration. And yet as the deductions of mathematical reasoning, though strictly infallible, are not obvious to our senses, they are no less adapted to quicken our diligence by the remoteness of truth, than to arrest our attention by its successive developement. Proceeding from the most simple and obvious principles, which no rational mind can dispute, they lead us step by step to the most abstruse and sublime discoveries; whilst nothing being asserted or admitted in the chain of consequences which is not deduced by infallible reasoning, however obscure or remote at our first setting out the object of our inquiry may appear, the result commands our full and free assent, from the means by which it is obtained. Confident that we shall not be disappointed, or that if we be careful in our process, we shall at least arrive at a rational conclusion, consistent with our fundamental principles, our diligence and attention are spurred on to the attainment of some certain reward.

The interest they excite by the certainty of demonstration, or the test of analysis, is not the only advantage an individual derives from the study of the Mathematics.—He acquires a habit of close and methodical argument in all his scientific researches, and, indeed, in every subject that engages his mind. For Mathematics are “the noblest *praxis* of logic or universal reasoning. It is through them we may perceive how the stated forms of *syllogism* are exemplified in one subject, namely, the *predicament of quantity*. By marking the force of these

forms as they are applied *here*, we may be enabled to apply them of ourselves elsewhere. Nay farther still,— by viewing the mind during its process in these syllogistic employments, we may come to know in part what kind of being it is; since mind, like other powers, can be only known from its operations. Whoever, therefore, will study Mathematics in this view, will become not only by Mathematics a more expert Logician, and by Logic a more rational Mathematician, but a wiser Philosopher, and an acuter reasoner in all the possible subjects, either of science or deliberation.” This habit of clear and demonstrative reasoning, which is acquired by the study of Mathematics, particularly of Geometry, is absolutely necessary to preserve the imagination in due subjection to the judgment, to prevent the understanding from becoming the dupe of our own weakness and caprice, or from being led captive by the wit and eloquence of others. The most effectual and successful means of persuading mankind is to delight them. No man was more convinced of this than the late Lord Chesterfield, who, therefore, in his letters to his son, inculcates the graceful forms and powers of oratory as the highest acquisitions of a public speaker. It is against the delusions and attractions of these, that our minds ought to be fortified by Mathematical reasoning. I cannot give a stronger instance of the necessity of this, than in the unjust applause given by the House of Commons to his Lordship, on the occasion of his bringing in a bill for reforming the calendar. “I gave them only,” says his Lordship, “an historical account of calendars, from the Egyptian down to the Gregorian, amusing them now and then with little episodes; but I was particularly attentive to the choice of my words, to the harmony and roundness of my periods, to my elocution, to my action. This succeeded, and ever will succeed; they thought I informed, because I pleased them; and many of them said, that I had made the whole very clear to them, when God knows I had not even attempted it. Lord Macclesfield, who had the greatest share in forming the bill, and who is one of the greatest Mathematicians and Astronomers in Europe, spoke afterwards with infinite knowledge, and all

the clearness that so intricate a matter would admit of; but as his words, his periods, and his utterance, were not nearly so good as mine, the preference was most unanimously, though most unjustly given to me." All that his Lordship urges in favour of eloquence in the speaker, is no less efficacious in shewing the necessity and advantage of that kind of reasoning in the hearer, which Mathematical speculations are so well calculated to supply. It is from these sciences alone that we acquire the habit and the power of analyzing any composition or piece of oratory into its simple elements, or of compounding, by the synthetical method, the arguments that we hear or read, or rather the truths which they contain, into a rational and consistent whole: and on that basis to form our opinion, and correct our judgment.

2. The natural effect of this habit of clear and methodical reasoning, is to extend man's general knowledge, and to free the mind from prejudice, error, and superstition. He who is accustomed to search for truth by the clearest light of reason, will hardly be induced, in any matter of importance, implicitly to rely on the vague testimony of others. He is equally proof against the *flash of wit*, the *fire of eloquence*, or the *fascinating charms of the muse*. Only in the sacred name of truth, or within the precincts of a rational propriety, will he recognise or admire them. His logic is the *Lydian stone* to try sound wits upon: and though he is far from believing that every subject which employs the thoughts of man admits of demonstrative proof, yet he deems nothing rational that does not in some degree assimilate with truth, or point to that *cynosure of human knowledge*. Thus the Mathematician is alike defended from error on the one hand, and from prejudice on the other. Nor is it to be imagined that those sciences which give us so clear and comprehensive a knowledge of the true system of the world, can ever suffer the mind of man to be debased by superstition. Will they not rather *inspire* him with the most profound reverence for that *all-wise Geometer*, and a just conception of his laws and *government*, who hangs the earth upon nothing, and who, *without the tedious deductions of human reasoning*, can *see at one view the whole chain of antecedents and consequents, from the simplest to the most sublime truth*

Much less can that calumnious suggestion be tolerated, that the Mathematician, by the continual contemplation of lines and numbers, instead of a habit of universal reasoning, acquires only a particular species, in which matter or magnitude alone being concerned, and truth being always discovered to him by the most infallible evidence, he is thence led to doubt the immateriality of the soul on the one hand, or the mysteries of divine revelation on the other. It is true that each science has its peculiar province, and that all do not admit the same degree of evidence ; yet all have one grand end in view, the discovery of truth ; and to this end, from their natural connexion with each other, each renders and receives mutual assistance. And if truth does not always appear with the same brightness, the evidence may be no less decisive on that account. Truth may be demonstrated even when veiled in mystery. The true Mathematician is a true Philosopher : he knows that there are mysteries in Mathematics and Physics, as well as in Metaphysics and Religion. He can prove the existence of the air, by the evidence of its force ; yet he knows not the nature of the particles it consists of, any more than he knows the nature of the soul, which, however, he can be proved to have from its faculties of understanding, memory, and will. He can prove by Mathematical demonstration, that there is a curve which continually approaches nearer and nearer to its asymptote, without a possibility of ever touching it ; and yet he can no more tell you why it should be so, independently of Mathematics, than he can prove the immortality of the soul, or the doctrine of the Trinity, without divine revelation. The sublime truths of Mathematics, though resting on the strongest evidence of demonstration, are not more obvious to the senses, than the great and mysterious truths of religion. There is this difference, however, that the former may be demonstrated to be true by human reason, though above its comprehension ; whilst the latter are also incomprehensible, but instead of the fallible deductions of reason, (I speak not of number and magnitude, nor of sensible things,) have for their basis the unerring word of divine testimony. But shall he who discovers mysterious truths by the principles of Mathematics in every region of science, doubt the truths of divine revelation ? Shall

who at every step is learning how to appreciate truth from the force of argument and evidence, scruple to believe in the attributes of the Deity, and the obligations of virtue? Rather let my judgment go with them, who can attribute to his intimate knowledge and deep contemplation of the sublime truths of Mathematics and Philosophy, the sincere belief and extraordinary zeal of a Newton; and to his ignorance of those truths, the scepticism of a Bayle.

(To be continued.)

Mr. EDITOR,

You cannot but allow that there is no class of people more neglected than Schoolmasters, who have bestowed great labours on their pupils. In the life of your prototype Mr. W. Emerson, by Mr. Bowe, it is said "that he applied himself with attention and diligence to the study of Mathematics, under the direction of Schoolmasters, *whose names I do not remember*, but of whom he used to speak, in the latter part of his life, with great respect." This omission I consider as very reprehensible; the names of the men who elicited the fire of that genius, should have been handed down to the latest period of posterity—they have rendered inestimable service to the cause of truth and of science—they were the means of enabling Mr. Emerson to write such a Course of Mathematics, as excels any similar work in any age or language.

But this omission is not confined to the life of Mr. Emerson. In most works on Biography, it will be found that in their youth, great men were sent to different renowned schools, and distinguished themselves; but seldom any notice is taken of the tutor; though, it is probable that, through his endeavours and example, the youthful mind was urged and lured to that state of perfection which it afterwards attained.

This is one of the unpleasant things which attends the profession of schoolmasters; yet I am glad to observe, that in high life it is generally otherwise; we find that Kings and Princes have provided liberally for their tutors, and have always considered them as men who had rendered them essential service.

It is my opinion that to withhold that praise which is due to merit is not only unfriendly, but unjust; therefore, I frankly confess, that whatever advances I may make in *pure and mixed Mathematics*, I shall attribute to the kind instructions and admonitions of the late Mr. John Cavill, of Beighton, near Sheffield. As I consider such men as *John Cavill* of considerable use in society, I shall subjoin a brief narrative of his life, which will, I hope, afford some entertainment to your readers.

I am, Sir, yours, respectfully, CONONUS.

Grammar-School, Hull, April 4th, 1815.

JOHN CAVILL, was born at Winteringham, in Lincolnshire, in the year 1748, of poor parents. Early in his life, his parents removed to Sheffield, in Yorkshire, where he was bound apprentice to a shoemaker. At a Sunday-school he was imperfectly taught to read and write, which was all the education he ever received! Therefore, it evidently appears that he had less assistance in learning than either Thos. Simpson, the mathematician, or Eugene Aram, a great linguist. Moreover, John Cavill had no emolument from the infamous practice of Astrology: he held in utter abhorrence, deceptions of this description. Soon after the expiration of the term of his apprenticeship, he married, and commenced the business of shoemaker. Not long after this, he had the misfortune to be deprived of his wife. He had now taught himself so far in figures, as to be enabled to make out a shoemaker's bill. At the age of twenty-eight, he married a second time; after which he bought some old books on Arithmetic, and perused them till he was master of *The Golden Rule*.—Now his prospects began to brighten: it is well known to arithmeticians, that he who understands *The Rule of Three*, and can operate with facility, will meet with few difficulties in his progress through Arithmetic—and that he who is ignorant of its rules, will always be involved in *difficulty, doubt, and obscurity*. Having now a competent knowledge of Practical Arithmetic, he was informed *at by the aid of Algebra he might be enabled to demonstrate the Rules of Arithmetic*. He now began to b

sensible, that without a general knowledge of the Mathematics, few of the branches could be thoroughly understood. He was so fortunate as to meet with *Ward's Young Mathematician's Guide*, a work which has tended to make more mathematicians than any other in the English language. With avidity he perused this production, and soon became master of simple and quadratic equations.—The Geometry therein contained, excited his curiosity to read Euclid. He obtained an edition of Euclid by Stone, (another self-taught mathematician,) with which, in a short time, he became very familiar. So eager was he in the pursuit of scientific knowledge, that he generally carried in his pocket a piece of chalk, with which he was wont to solve geometrical and algebraical problems upon the soles of shoes. Nay so arduous was he before he quitted the business of shoemaker, that he would frequently stop on the road to work problems on the flags, or any large stone which presented itself. With such a determined spirit and persevering inclination, it cannot be considered as a matter of astonishment, that he attained considerable eminence as a mathematician. He used to be indignant at those who complained of the want of time. He justly observed, that they had time to smoke, drink, and see raree-shows, but none for the improvement of their minds.

At the age of thirty-five or thirty-six, he removed from Sheffield Park, to Hackenthorpe, a small village about four miles from Sheffield, where he followed his trade for nearly five years; during which time he devoted all his leisure hours to the study of science. Previously to this he had corresponded with the editor of *The Lady's and Gentleman's Scientific Repository*, and had several ingenious solutions inserted in that work; which, I have heard him observe, tended to stimulate him to greater exertions—an additional proof how useful such publications are. *The Ladies' and Gentleman's Diaries* attracted his notice, to which he contributed many years. *The Mathematical Companion*, and *Professor Leybourn's Mathematical Repository, new series*, have been aided by his contributions.—In the *Rockingham newspaper*, published at Hull, appeared, in his name, many ingenious problems, and solutions,

During his residence at Hackenthorpe, a person to fill the offices of schoolmaster and parish-clerk was wanted at Brighton. He applied, and readily obtained the appointment, which he held till his death ; this took place on the 11th of April, 1814.

The disposition of Mr. John Cavill was truly amiable.— He, though a humble representative, was, like the great Emerson, ready and willing to assist any student, as far as he was able, without fee or reward. His example operated powerfully on the minds of mathematicians within the circle of his acquaintance. Such a man is of very great use as a schoolmaster. He has no fear of his pupils surpassing him ; therefore is not under the necessity of turning them back, in order to make them more perfect, as ignorant teachers often pretend. Mr. Cavill was wont to observe, that “a sound mathematician teaches faithfully ; he knows all the essential parts of Mathematics which are necessary to be taught to young men, and their bearings upon each other : that Surveying is only a few problems in Mensuration ; that Navigation is but Trigonometry, under a different name ; and he who is master of Mensuration and Trigonometry, will fully comprehend Surveying and Navigation in a fortnight.”

To the EDITOR,

SIR,—The following account of “The manner of taking the Whale,” was put into my hands as the production of a respectable gentleman who has visited the Frozen Ocean,

Where snowy billows leave their awful bed ;
And icy mountains strike the soul with dread !

Should you think it worthy the notice of your readers, (and probably many of them have some dear relative employed in that hazardous, and too often perilous trade,) you are quite at liberty to publish it.

I am, Sir,

Your respectful humble Servant,

Hull, April 1st 1815.

OBSERVER.

THE MANNER OF TAKING THE WHALE.

WHEN a ship has arrived at the bay or place intended to fish in, she remains "dodging" about, with sufficient canvass set to keep her clear from ice, and in such a situation as circumstances make desirable. According to the size of the ship, she has six or eight whale-boats on board, from 22 to 24 feet in length, and about 6 feet in breadth; sharp at each end, with six or eight oars, and equipped in the following manner: from 6 to 800 fathoms of line is coiled aft, in the most exact and curious way; so that, when fast to a fish, it seldom happens the lines run foul. To the end of each boat's line is fastened a harpoon, which is fixed at the boat's head, the point resting upon the stem, and the shaft placed in what is termed a *meek* or bracket, so that the harpioneer can seize it in a moment. Each boat is also provided with some loose harpoons, a quantity of lances, knives, a grapping iron, hammer, ax, horn, jack-flag, small boat hooks, fin-tows, a squab, and a compass.

A boat is manned from the watch upon deck, and sent away on the look-out. That part of the watch on board keeps a strict eye on the boat, observing all its motions: and when at too great a distance to be distinctly seen from the deck, some one goes aloft into a place called the "crow's nest," which is at the main topmast head; where, with a glass, he can distinguish what is doing in the boat. In this state, not the least noise is permitted, even in walking the deck, lest any part of the crew below should be disturbed; for it is necessary that every man should enjoy the repose allowed him without molestation, it being uncertain in how short a time he may have to undergo the greatest fatigues.

When a fish is discovered at any distance by those in the boat, (a whale may be seen and heard two miles,) every exertion is used to make all possible way towards it; the harpioneer and boat-steerer continually inciting the rowers with "Now my canny fellows!—my dear, dear lads! pull away—pull away!—there she blows!—we're just upon her!" &c. &c.—though perhaps not within a mile of the fish: but this the rowers are ignorant of, no man being permitted to look over his shoulder.

Should the whale continue upon the surface until the boat get within a few yards of her, and she appear shy, whilst the sea is smooth, it is generally sculled upon her;—but should there be any swell or ripple upon the water, so that the oars may not be heard, the boat is then pulled directly against the fish, when the harpioneer immediately plunges his harpoon into her, with “*There my jewel—there you have it,*” &c. &c.

It often happens, that when a boat is within five or six yards of a fish, she takes the alarm and sheers off—so that the harpioneer, seeing no other chance, *heaves* the harpoon at her, which gets fast, or not, according to the distance at which it is thrown.

The blow is no sooner given, than the whale dives down with a desperate flurry, taking line at a great rate.—The oars are thrown out, jack hoisted, and every man remains steadily in his place; the boat-steerer having an eye to the line, whilst the harpioneer has several turns of it on a round piece of wood, fast in the boat’s stem, called a “*bullard*,” resembling a hatter’s block, by which he is enabled to check the velocity of the fish, and contribute greatly to its fatigue.

As soon as the boat’s jack is discovered from the ship, “*a fall*” is called;—which is done by the men upon deck arming themselves with capstern-bars and handspikes, or whatever comes first in the way, and beating them violently against the deck and hatches; at the same time running, jumping, and shouting “*a fall! a fall! a fall! a fall!*” In an instant all hands are upon deck, with their clothes in their hands, (which, on “*turning in*,” had been tied together); the boats are lowered, manned, and sent away, and the greatest exertions are made to come up with the fast boat. In the mean time, the doctor hoists a jack on the mizen-top-gallant-mast, in answer to the fast boat; the ship is then distinguished by others in the country to be what is called a “*fast ship*.” The cook, and his mate, with the remaining hands on board, assist in working the ship, whilst the master, with his glass, ascends into the crow’s nest.—Amidst the uproar and apparent confusion of “*a fall*,” it is difficult for a stranger to be

persuaded, on the moment of awaking, that the ship is not going down, or that some other dreadful catastrophe is not at hand; it is an astonishing scene, and never fails to affect, in a powerful degree, the mind of a person for the first time, notwithstanding his being cautioned of it before.

When the boats from the ship have got up to the fast boat, and the fish has not been upon the surface since "struck," (a fish will sometimes continue below an hour after the first harpoon is given), each is placed in that direction in which it appears probable, from the situation of the fast boat's head, and the quantity of line out, the fish will come up again.—One boat generally keeps near to that which is fast, so that when her lines are almost "run out," those of the other boat may be "bent on."—

As soon as the whale is again discovered, the boats strive against each other to be first alongside her; and unless they lay very wide, and she be not much fatigued, some one mostly succeeds in giving a second harpoon, when probably she again plunges; but it seldom happens a fish continues long under the surface with two harpoons. On her next appearance, a third boat gets fast, and the whale is then considered safe, unless very furious, or amongst much ice, when a fourth harpoon is thought necessary.—When three or four boats are fast to a fish, she remains upon the water, blowing and beating in a terrible manner, or goes down for a few minutes only. The lancing-boats then approach, and pull directly against the fish, so that they are in danger of being sent down every moment by a blow from her immense tail, (twenty to thirty feet in breadth,) which makes it extremely necessary to be very active, cool, and resolute, avoiding the least confusion, the life of every individual at this time depending upon the proper management of the boats.

The harpooneers endeavour to strike their lances abeam the fins and blow-holes—the only part where a wound can be given with effect; for wounds about the ribs, or other places of the body, serve but to torment and increase the rage of the fish, without expediting its capture.—When a lance is plunged into either of the above-mentioned places, it is thrust in four or five feet deep, and drawn up and down like churning; the agonized fish heaving its tail a considerable height, and beating it in a terrible manner.

upon the water ; at the same time spouting blood all over the boats, whilst the sailors are crying out, “ *There she spouts claret !—there, her chimney’s on fire !* ” &c. At length the poor tortured fish expires, and turns on its back, when all the boats’ crews give three cheers, and strike their jacks ; which, on being discovered from the ship, is answered by three cheers on board, and her jack likewise is hauled down.

The fast boats’ lines are then cut from the fish and coiled in the boats, with the same exactness as at first ; which to the first fast boat is a long and disagreeable duty in bad weather, having probably several hundred fathoms out : the other boats, perhaps, having run but little line, are mostly ready to assist at towing the fish to the ship.

A hole is made in the under lip, and a line passed through it, which is secured to a boat, and prevents the head from sinking ; holes are also cut in the fins, which are lashed together by a fin-tow ; the tail is supported in the same manner as the head. The boats are then made fast to each other, and the labour commences, amidst continued “ *huzzas*,” of towing the fish to the ship,—which is often two miles distant, and cannot make sail towards the boats, from ice or contrary winds. Having got the fish to the ship, she is lashed head and tail to the larboard side, the boats are hoisted up, and every thing is made ready for “ *flinching*.”

The whale, as before observed, being lashed to the larboard side of the ship, every man puts on his *flinching* dress, consisting of a seal-skin jacket and trowsers, (procured from the native Greenlanders) and large jack-boots. Drums are next delivered out, when the business of “ *flinching*” commences, each class having its allotted birth.

The harpooneers are upon the fish, and with knives, from two to three feet in length in the blade, and about the same in the shaft, take off the blubber by what are termed *slips*, or large pieces of great weight, (perhaps several tons,) which slips are made fast to vast blocks and tackle secured to the main-mast, so that as they are gradually separated from the fish, the tackle, which is

worked by the windlass and crab, hoists them upon deck, when the boat-steerers cut them into pieces of nine or twelve inches square. The *picky-hawk* men (rowers) are employed in heaving those pieces through a square hole in the main hatches, in the *flinch-gut* or hold. A third set is engaged at the windlass and crab; and a fourth is the "*mallinaux-boys*" in the jolly-boat, alongside the whale. The master, with one of the mates, generally superintends the management of the tackle, whilst the doctor assists at the windlass—the cook, and his mate, being at the crab.—A fish will take three or four hours flinching, and frequently as many whales are *killed and finched without going to rest*. "Making off," is the further progress and finishing with the blubber on board.—When a ship has more blubber than can be stowed in the hold and 'tween decks, she is either made fast to an ice-berg, (ice-mountain) or run into an harbour; but the latter is generally preferred in Davis' Straights.—A stage is raised about two feet above the deck, on which large square pieces of the tail are laid, serving as blocks for the blubber to be chopped upon. The empty casks are made ready, and the loose ones put together.—The blubber is then thrown out of the "*flinch-gut*" upon deck, and "*cranged*," that is—the flesh and skin taken off; so that nothing remains but fat, which is placed upon the above-mentioned blocks, and chopped into "*finks*," or pieces about nine inches long, and three square, to admit of their going through the bung-holes into the casks.

When the casks are made as full as possible with the hand, a blunt fork is used to press the blubber close, which is called "*pricking*," for it is very necessary that the casks should be well filled, that no room be lost, and also on account of the blubber fermenting, which would throw the bungs out, or burst the casks, when the ship came to work at sea. The bungs have tins nailed over them. When finished "making off," the ship is unmoored, and again goes in pursuit of fish.

A person may be very partial to the whole of the whale-fishery but making off, which certainly is the most "disagreeable of all disagreeables,"—being a tedious, noisy, filthy, harassing business.

By this short account of the whale-fishery, may be seen, in some measure, what those undergo who are employed in it; and who, it must be allowed, are deserving of all they get, even in the most successful season—considering the dangers they encounter in the dreary voyage, and their engaging at close quarters with so tremendous a creature as the whale.

ON THE ESTEEM AND USE OF MUSIC AMONG THE ANCIENT GREEKS.

LET us next consider the esteem and use of Music among the ancient Greeks. The glory of this art among the Greeks, appears first, according to the observation of Quintilian, by the names given to the poets and musicians, which, at the beginning, were generally the same persons, and their characters were thought to be so connected, that the names were synonymous; they were called also, sages or wisemen, and the inspired. Salmuth on Pancirollus, cites Aristophanes to prove, that by one skilled in playing on the harp, the ancients meant a wiseman, who was adorned with all the graces; as they reckoned one who had no ear or genius for music, a stupid person, whose frame was disordered, and the elements of his composition at war among themselves:—And so high an opinion had they of it, that they thought no industry of man could attain to such an excellent art; and hence, they believed this faculty to be an inspiration from the Gods; which also appears particularly by their making Apollo the author of it, and then making their most ancient musicians, as Orpheus, Linus, and Amphion, of divine extraction. Homer, who was himself both poet and musician, could have supposed nothing more to the honour of his profession, than in making the Gods themselves delighted with it: After the fierce contest that happened among them about the Grecian and Trojan affairs, he feigns them recreating themselves with Apollo's music; and after this, it is no wonder he thought it no below his hero to have been instructed in, and a diligent

practiser of this noble art. And do not the poets universally testify this opinion of the excellency of music, when they make it a part of the entertainment at the tables of kings; where, to the sound of the harp, they sung the praises of the Gods and Heroes, and other useful things. Homer, in his *Odyssey*, introduces Demodocus at the table of Alcinous, king of Pheacea, singing the Trojan war, and the praises of the heroes; and Virgil brings in Jopas at the table of Queen Dido, singing to the sound of his golden harp, what he had learned in Natural Philosophy, and particularly in *Astronomy*, from Atlas; upon which Quintilian makes this reflection, that hereby the poet intends to shew the connection which exists between music and heavenly things; and Horace teaches us the same doctrine.

At the beginning, music was perhaps sought only for the sake of innocent pleasure and recreation, in which view Aristotle calls it the medicine of that heaviness which proceeds from labour; and as this is the first and most simple, so it is certainly no despicable use of it; our circumstances require such a help to make us undergo the necessary toils of life more cheerfully. Wine and music cheer the heart, said the wise man; and universal experience confirms the remark, that the same power still remains. The severest of the philosophers approved of music, because they found it a necessary means of access to the minds of men, and of engaging their passions on the side of virtue and the laws: thus was music maid and handmaid to virtue and religion.

Jamblichus, in the life of Pythagoras, tells us, that music was a part of the discipline by which he formed the minds of his scholars. To this purpose, he compelled, and taught them to compose and sing, verses calculated to act against the passions and diseases of their minds; which were also sung by a chorus, standing round one that played upon the harp, the modulations whereof were perfectly adapted to the design and subject of the verses. He used also to make them sing choice verses out of Homer and Hesiod. Music was the first exercise of his scholars in the morning, as necessary to fit them for the duties of the day, bringing their minds to a right temper: he designed it also as a kind of medicine against the pains

of the head, which might be contracted in sleep ; and at night before they went to rest, he taught them to compose their minds after the perturbations of the day, by the same exercise. Whatever virtue the Pythagoreans ascribed to music, they believed the reason of it to be that the soul itself consisted of harmony ; and therefore they pretended by it, to revive the primitive harmony of the faculties of the soul :—By this primitive harmony they meant that which, according to their doctrine, was in the soul in its pre-existent state in heaven. Macrobius, who is plainly Pythagorean in this point, affirms, that every soul is delighted with musical sounds ; not the polite only, but the most barbarous nations practise music, whereby they are excited to the love of virtue, or dissolved in softness and pleasure : the reason is, says he, the soul brings into the body with it the remembrance of the music with which it was entertained in heaven : and he adds, there are certain nations that conduct the funerals of their dead with singing, because they believe the soul returns to heaven, the fountain or original of music. And because this sect believed the Gods themselves to have cœlestial bodies of the most perfect harmonious composition, therefore they thought the Gods were delighted with it ; and that by our use of it in sacred things, we not only compose our minds, and fit them better for the contemplation of the Gods, but imitate their happiness, and are thereby acceptable unto them, opening for ourselves a return into heaven.—Athenéus reports of one Clinias, a Pythagorean, a very choleric and wrathful man, that as soon as he found his passion begin to rise, took up his harp and sung, and by that means allayed it. But this discipline was older than Pythagoras, for Homer tells us, that Achilléus was educated in the same manner by Chiron, and feigns him, after the hot dispute which he had with Agamemnon, calming his mind with his song and harp : and though Homer should be the author of this story, it shows however that such a rise of music was made in his days ; for it is reasonable to suppose that he had learned this from experience.

The virtuous and wise Socrates, was no less a friend to this admirable art ; for even in the decline of his age, he applied himself to the harp, and carefully recommended it

to others. Nor did the divine Plato differ from his great master in this point; he allows it in his "Commonwealth," and in many places of his works, speaks with the greatest respect of it, as a most useful thing in society: he says it has as great influence over the mind, as the air has over the body; and therefore he thought it was worthy of the law to take care of it: He understood the principles of the art so well, that, as Quintilian justly observes, there are many passages in his writings not to be understood without a good knowledge of it. Aristotle in his "Politics," agrees with Plato in his sentiments of music. Aristides, the Philosopher and Musician, in the introduction to his treatise on this subject, says, it is not so confined either as to the subject, matter, or time, as other arts or sciences, but decorates all the parts and actions of human life; it beautifies the mind with the ornaments of harmony, and forms the body with decent motions; it is proper for youth, because of the advantages obtained by singing; for persons of riper age, by teaching them the ornaments of modulate diction, and of all kinds of eloquence; to others more advanced, it teaches the nature of number, with the variety of proportions, and the harmony that thereby exists in all bodies, but chiefly the reasons and nature of the soul. As wise husbandmen, continues he, first cast out weeds and noxious plants, then sow the good seed; so music is used to compose the mind, and prepare it for receiving instruction: for pleasure, is not the proper end of music, which affords recreation to the mind only by accident, the proposed end being the instilling of virtue. Again, he adds, if every city, and almost every nation, loves decency and humanity, music cannot possibly be useless. It was used at the feasts of princes and heroes, according to Athenaeus, not out of levity and vain mirth, but rather as a kind of medicine, that making their minds cheerful, it might help their digestion. There, says he, they sung the praises of the gods and heroes, and other useful and instructive compositions, that their minds might not be neglected, whilst they took care of their bodies; and that from a reverence of the gods, and by the examples of good men, they might be kept within the bounds of sobriety and moderation.

But we are not confined to the authority and opinion of Philosophers, or any particular persons ; we have the testimony of whole nations where it had public encouragement, and was made necessary by the law, as in most parts of the Grecian commonwealths. Athenéus assures us, that, anciently all their laws, divine and civil, exhortations to virtue, the knowledge of divine and human things, the lives and actions of illustrious men, and even histories (he mentions Herodotus), were written in verse, and publicly sung by a chorus, to the sounds of instruments ; they found this by experience an effectual means to impress morality, and a right sense of duty ; men were attentive to things that were proposed to them in such a sweet and agreeable manner, and attracted by the charms of harmonious numbers, and well modulated sounds, they took pleasure in repeating these examples and instructions, and found them easier retained in their memories.— Aristotle also, in his problems, tells us, that before the use of letters, their laws were sung musically, for the better retaining them in memory. In the story of Orpheus and Amphion, both of them Poets and Musicians, who made a wonderful impression upon a rude and uncultivated age, by their virtuous and wise instructions, enforced by the charms of poetry and music :—The succeeding poets, who turned all things into mystery and fable, feign the one to have drawn after him, and tamed the most savage beasts, and the other to have animated the very trees and stones, by the power of music. Horace had received the same traditions of all the things I have now narrated, and with these, he mentions other uses of music, in his Art of Poetry.

From what has been said, it is evident, that the art of music was publicly honoured by the governments of Greece. It was by the law made a necessary part of the education of their youth. Plato assures us it was thus at Athens ; in his first Alcibiades, he mentions to that great man in Socrates's name, how he was taught to read and play on the harp : and in his Crito, he says, did not the laws most reasonably appoint that your father should educate you in music ? And we find music generally named, as one of the known and necessary branches of

the education of youth, especially of the higher class. Plutarch and Athenéus give abundant testimony to this; and Terence, having laid the scene of his plays in Greece, or rather only translated, and at most but imitated Menander, gives another proof, in act 3d, scene 2, of his Eunuch. The use of music in the temples and solemn service of their gods, is past all question. Plato, in his Dialogues concerning the Laws, gives this account of the sacred music. 1st. That every song consist of pious words. 2d. That we pray to God to whom we sacrifice. 3d. That the poets, who know that prayers are petitions or requests to the Gods, take good heed that they do not ask ill instead of good, and do nothing but what is just, honest, good, and agreeable to the laws of the society; and that they shew not their compositions to any private persons, before those have seen and approved of them, who are appointed judges of these things, and keepers of the laws: —then, hymns to the praises of the Gods are to be sung, which are very well connected with prayer. As they had poetical compositions upon various subjects for their public solemnities, so they had certain determinate modes, which it was unlawful to alter. They were jealous of any innovations in this matter, fearing that a liberty being allowed, it might be abused to luxury; for they believed there was a natural connection between the public manners and music. Plato denied that the musical modes or laws could be changed, without a change of the public laws; he meant, the influence of music was so great, that the changes in it would necessarily produce a proportionate change of manners and the public constitution. The use of music in war, will readily be allowed to have been by public authority, and the thing we ought to remark is, that it was not used as a mere signal, but for inspiring courage, raising their minds to the ambition of great actions, and freeing them from base and cowardly fear.

From Athens let us go to Lacedemon, and there we shall find it in equal honour: their opinion of its natural influence was the same with that of their neighbours; and to shew what care was taken by the law, to prevent the abuse of it to luxury, historians record that Timotheus was fined for having more than seven strings on his harp.

and those which were added ordered to be taken away. The Spartans were a warlike people, yet very sensible of the advantage of fighting with a cool and deliberate courage; therefore as Gellius, out of Thucydides, reports, they used not in their armies, instruments of a vehement sound, that might inflame their temper, and make them mere furious, as the trumpet, horn, and cornet, but the more gentle and moderate sounds and modulations of the flute and pipe, that their minds being more composed, they might engage with a rational courage: and Gellius tells us, the Cretans used the harp to the same purport in their armies:—This people entertained at a great expense the famous Thales to instruct their youth in music: and after their music had been thrice corrupted, thrice they restored it. If we go to Thebes, Epaminondas will be a witness of the esteem it was in there, as Cornelius Nepos informs us. Athenéus reports, upon the authority of Theopompus, that the Getan Ambassadors, being sent upon an embassy of peace, made their entry with harps in their hands, singing and playing to compose their minds, and make themselves masters of their tempers; we need not then doubt of its public encouragement among this people. But the most famous instance in all Greece, is that of the Arcadians, a people, says Polybius, in reputation for virtue among the Greeks; especially for their devotion to the gods. Music, says he, is esteemed every where—but to the Arcadians it is necessary, and allowed a part in the establishment of their state, and an indispensable part of the education of their children. And though they might be ignorant of other arts and sciences without reproach, yet none might presume to want knowledge in music, the law of the land making it necessary; and insufficiency in it, was reckoned infamous among that people. It was not thus established, he says, so much for luxury and delight, as from a wise consideration of their toilsome and industrious life, owing to the cold and melancholy air of their climate; which made them attempt every thing for softening those austerities they were condemned to endure: and by the neglect of this discipline, he accounts for the barbarity of the Cynethians, a people of Arcadia.

J. Y.

Guisbro'.

ON BIOGRAPHY.

BIOGRAPHY has been defined to be "History teaching by example," and it cannot be doubted that the lives of men, who have been eminent in their day and generation for their virtues and their talents, are often highly entertaining and instructive. The lives of bad men may also be useful, if their errors and their vices are held up as beacons to succeeding generations, to avoid those quick-sands and shun those rocks and shoals on which they have foundered. But how dreadfully pernicious to the morals of society must those biographical publications be, which array licentiousness in the spotless robes of virtue, and represent a prostitute as having ascended to heaven*!

I have been led into these reflections by reading the life of a gentleman, related in the 7th volume of *Public Characters*, published by Sir Richard Philips,

"That industrious, plodding wight,
Who's (by the King's good favour) dub'd a *Knight*;"

And who, if the following account given by a late writer be true, has written that sketch of his character himself: "Mr. —'s expressions concerning me, in the sketch of his life, *written by himself*, in the 7th volume of *Public Characters* (for though the author's name is not mentioned, I recognise the well-told tale to be the production of his own pen) has drawn this explanation from me." See life of Mrs. S. Wells.

What can be more derogatory to the science of Biography, or more injurious to sound morality, than that a man, who, by his profligate habits and immoral example, has done incalculable mischief, should oblige the world with memoirs of his own life, and condescend to be his own panegyrist! Were the example of this *modest* gentleman to be generally followed, the pages of Biography, instead of relating the lives of the great and the good, would be sullied with the exploits of military coxcombs, infidel philosophers, actresses, kept mistresses, profligate men, and harlots:—such would be the garbage that succeeding generations would have to feed on.

* Pratt's Epitaph on the unfortunate M. A. Robinson.

As the happiness, as well as the strength of a nation, depends more upon the virtue than upon the number of its inhabitants, who can observe without the most painful sensations the want of moral principle exemplified in the late conduct of the French Marshals, and other Officers, those descendants of the disciples of Diderot, of Rousseau, of Voltaire, and other infidels: whilst the oath to their lawful Sovereign was scarcely out of their lips, they add treason to perjury, and bring again into power the Prince of Tyrants and of Infidels.

“ If oaths be disregarded—come confusion;
 “ Come wild disorder, leading by the hand
 “ The harlot vice, disfeatur’d of humanity,
 “ And every social grace.”

He, therefore, who by his precepts and example does all in his power to break down the sacred barrier between virtue and vice, and to trample on the wholesome institutions of his country, contributes what in him lies to throw society into a horrible state of confusion, and to rob the sacred names of “ father, son, and brother,” of all their endearing charms; and, whatever may be his talents, is an enemy to his country; and if his name be handed down to posterity, his biographer, if he do him justice, will render him infamous.

“ Talents angel bright,
 If wanting worth, are but shining instruments
 In false ambition’s hand, to finish faults
 Illustrious, and give infamy renown.”

2.

A REPLY TO AGRICOLA.

MR. EDITOR,

I WAS inclined to communicate this in time for insertion in No. III.; but hoping that some contributor more competent than myself might take up arms in defence of the manufacturer and merchant, I then desisted:—not seeing any reply to an essay (in No. II.) signed Agricola, I now feel an impulse, which I cannot resist, of addressing you on this complicated subject; relying on your impartiality.

and candour for its publicity. As the readers of the Q. V. have seen so many reasons urged in favour of the agriculturist, they will not be displeased to hear what can be advanced in behalf of the manufacturers, who are as much alive to their interest as their opponents. I shall be as brief and plain as possible, for I conceive that truth, like dress, is the most pleasing when the least ornamented.

To Agricola's doctrine, Sir, I can never subscribe, neither can I ever be made to believe that "Britain" will be "Independent of Commerce."

Agricola boldly asserts "if a death-blow be given to our agriculture, every village will become a workhouse, and every inhabitant a pauper." Does he really mean to insinuate, that bread sold at a reasonable price will cause such a direful calamity? Will all the farmers quit the plough, and give up all kinds of labour, and retire in sloth, with their families, to the workhouse, until they have filled all the villages in the land? This can never be the case so long as human nature requires sustenance, or the earth yields its fruits to the hands of the husbandman; for if the cultivation of grain did not answer the purpose, it is manifest the land would never become barren. Surely those fields, which can produce grain, might be converted to other purposes: cattle, milk, butter, cheese, wool, timber, vegetables, roots, and the different fruits of the earth might be more abundantly thrown into the market; and I suppose the corn land would be no less fertile for having a little rest, when interest prompted the owners to have recourse to the plough again.

It is universally admitted, that self interest is a most powerful pleader, and in the pursuit of it, we are but too often influenced to overstep the limits of plain reason and common sense; therefore, we ought to be upon our guard, and not believe all reports as truth, propagated by interested individuals. This stickler for high-priced provisions seems to speak with as little indifference of the loss of our commerce, as a lady would on the loss of her glove, which he affirms will be the case, whether our provisions be raised or not. "That it is the source of all our wealth and greatness, is a delusion which Mr. Spence had the honour most effectually to expose, and whose reasonings have hitherto been combated only by the idlest sophisms."

This is a bold assertion; but let us see how far it is consistent with what is mentioned in a former page. After describing the Poles and Russians as living on an unwholesome mixture of barley and rye, he there insinuates that the introduction of commerce will so far improve their present condition, that they will be enabled to purchase a more costly bread; and "the boor, throwing aside his present loathsome crusts, consumes the very grain he now cultivates for others to enjoy!"

If Poland and Russia can be improved by commerce, he certainly must allow the same of Britain, and the peasant, throwing aside his brown bread and jannock, has been also enabled, by commerce, to enrich the land-owner, by purchasing a more nutritious and expensive bread. Does not this prove the utility of trade?

After delineating the distressing condition of the farmer, caused by selling cheap grain to the manufacturers, he says, "but this cheapness, in proportion as it deadens agriculture, quickens the efforts of the manufacturer. He adds to the number of his hands, and no more labourers are left than are demanded by the farmer." This will appear a ridiculous blunder indeed, when contrasted with the following: "whether we have or have not laws to keep up the price of grain, we must be content to see our commerce leave us, to flow in other channels." When the manufacturer, through the depression of trade, will be under the dreadful necessity of discharging his workmen, how, in the name of wonder, can he *add* to the number of his hands?

I suppose it will be obvious to many, what course these unemployed stragglers would pursue: the most valuable amongst them, the ingenious and spirited, would immediately emigrate in quest of their lost trade; the mean, idle, and vindictive, would associate for the purpose of mischief, plunder, and revenge, making the day dreadful and the night hideous; the poor, aged, weak, and infirm, must all retire to the workhouse; where they have, (according to Agricola,) board and lodging provided for them, at an expense of £15 each, per annum, to the parish.

Though the farmer might take some advantage of the poverty-struck manufacturer, to ease himself a little by the reduction of wages, yet he would be so overloaded by the suffocating weight of parish-rates, increasing taxation, and other grievances, caused by the absence of trade, that his landlord must immediately take the burden to himself.

If Agricola's predictions be true with respect to the loss of our commerce, (which I earnestly hope, for the welfare of my country, are founded on error,) the expedient which he advocates would soon find its limits, for the benefit arising from the advance in provisions would be inadequate to the other swelling burdens.

Again, see how he proceeds: "if our external commerce had been essential to us, the operation of the Berlin and Milan decrees, and non-importation act, must have been our ruin; instead of that, though a few towns were injured, the national income and taxes were never greater." This gigantic argument is as fertile as the former; and he seems to have totally forgotten, that the excise fell off considerably, at the time our commerce was shackled with the above restrictions. At that sanguinary moment, when threatening storms were gathering round us, our commerce did not ultimately die. It was only a temporary sickness, a part of it fell into indirect channels; and when almost all markets were shut against us, there was considerable traffic carried on, even upon the open sea:—this several merchants of Manchester can testify. Others were storing their warehouses with goods, in hopes of something turning up, which in the end did; and relieved them from their extreme anxiety; and also enabled them to dispose of their immense stock of goods.

"The foreign grower pays no tax for imported produce, and the failure must be made up by an additional tax levied upon the manufacturer." Indeed! and are these callous advocates for high prices so far blinded, as not to see the impossibility of levying additional taxes on the manufacturer, when his "commerce is flowing in other channels?" "As the farmer is not allowed to export his own wool, the woollen-manufacturer pays him just what price he pleases." The reverse of this is the fact, for the

farmer will have his own price for his wool, and has advanced it to such an enormous pitch at present, that it is sensibly felt by the people in general, in the rise of clothes. When grain is advanced, the shepherd must give way to the plough, which diminishes the growth of wool, in proportion as the stock of grain is increased; so that wool will become dear by scarcity, and grain by law; and where could he find a better market, if he were permitted to export it.—The encouragement and protection given to the hat-maker and others, mentioned by Agricola, may easily be proved to be a public good, and beneficial to the potent land owner himself; therefore, I am sorry that there is a stumbling-block thrown in the way of honest industry.

After saying that “rents and tythes ought to be kept up,” he immediately nullifies the assertion, by the following remark: “it is true they must be ultimately lowered, necessity will cause their abatement.”

The boasted commerce of Britain dependant on foreigners, is calculated down to the poverty fraction of $\frac{1}{4}$;—this has excited many merry fits amongst our enlightened merchants. And there is a curious *cock and bull story*, in which is a statement of the population of the kingdom costing £20 a-head, per annum; when it is but too well known that thousands of families of six persons, are supported by 21 shillings per week; and many even less than that.

(To be concluded in our next.)

To the Editor of the QUARTERLY VISITOR.

SIR,

PERMIT me, through the medium of the *Quarterly Visitor*, to request that some of your intelligent correspondents would favour your readers with the *origin, progress, present state, and general utility of Forums.*

I am, Sir, your obedient Servant,

Land of Green Ginger.

OBSERVER.

FOR TRANSLATION.

An Inscription for the Monument of DIANA, Countess of Oxford and Elgin ; communicated by Mr. WILLIAM HYSLOP, Classical Tutor in Mr. PUTSEY's Academy, Pickering.

Diana Oxonii et Elgini Comitissa ;
 quæ
 Illustri orta sanguine, sanguinem illustravit ;
 Ceciliorum meritis, clara, suis clarissima ;
 Ut quæ nesciret, minor esse maximis.
 Vitam ineuntem Innocentia ,
 Procedentem ampla Virtutum Cohors :
 Exeuntem Mors beatissima decoravit ;
 (Volente Numine)
 Ut Nuspiam decesset aut virtus aut felicitas,
 Duobus conjuncta Maritis
 Utrique charissima :
 Primum
 (Quem ad Annum habuit)
 Impense delexit :
 Secundum
 (Quem ad Annos viginti quatuor)
 Tanta pietate et amore coluit ;
 Ut qui vivens,
 Obsequium, tanquam Patri præstitit ;
 Moriens,
 Patrimonium, tanquam Filio, reliquit.
 Noverca cum esset,
 Maternam Pietatem, facile superavit.
 Famulitii adeo mitem prudentemque curam gessit,
 Ut non tam Domina Familiæ præesse,
 Quam Anima Corpori inesse videretur
 Denique,
 Cum pudico, humili, forti, sancto animo,
 Virginibus, conjugibus, Viduis, omnibus
 Exemplum consecrasset integerrimum,
 Terris Anima major, ad similes evolavit superet.

Poetry.

THE DOVE.

SEE, Mary, see the trembling Dove,
 Hovering o'er her tender brood ;
 How she mourns her absent love,
 Gone to seek the younglings food.
 " Haste, my love, haste back to me,
 " Or I shall die for love of thee."

See how broad her wings are spread ;
 What anxious cares disturb her rest ;
 How she hangs her drooping head,
 And thus relieves her panting breast :—
 " Haste thee back, my love, to me,
 " Or I shall die for love of thee."

The young ones cry for want of food,
 Alas ! she can't their want supply ;
 She lifts her head, and looks abroad,
 But sees not yet her lover nigh.
 " Haste thee back, my love to me,
 " Haste, or I shall die for thee."

Hark ! how she coos their cries to still ;
 In vain, alas ! her efforts prove ;
 Relentless fate resists her will,
 And keeps afar from her, her love.
 " Haste, haste my love, come back to me,
 " Or I shall die for love of thee."

See how she droops, worn out with pain,
 While panting on the nest she lies ;
 Her languid head she lifts again,
 And, faintly, thus the suff'rer cries,
 " Haste, haste my love, and come to me,
 " Or I shall die for love of thee."

See, see he comes across the plain !
 See, how he cleaves the liquid air !
 He quickly finds the nest again,
 And finds his faithful partner there.
 " Hast thou return'd, my love, to me ?
 " Then will I live for love of thee."

The lovers vent their passion free,
And fondly on each other gaze;
The young are fed—the mother, she
Thus to her partner fondly says,
“ How couldst thou stay so long from me,
“ Who only lives for love of thee?”

Let us, Mary, from the Dove,
Learn to spend our span of time
Let us taste the sweets of love,
While we yet are in our prime :
Say but thou wilt be kind to me,
And I shall live in love with thee.

Bridlington, Oct. 8th, 1814.

LITERARIUS.

ON PITY.

LET melting pity pierce the heart,
The mortal breast to move:
And let compassion e'er express
True charity and love.

To see a man o'erwhelm'd with woes,
And storm'd by direful grief—
Grasp'd by the pangs of awful want,
And void of all relief !

Let sympathetic love, for e'er
Enflame the gen'rous breast;
Comiserate the needful's woes,
And hear their sad request.

Let pity mild, its healing balm
And gentle influence spread
On those, who thro' life's thorny paths,
In miseries are led.

To see the poor cast down with want,
And hear their sad alarms ;
Each mind benign, born to relieve,
With secret pity warms.

Let this e'er-lov'd and noble queen,—
This mild celestial maid,
Without whose ever helpful balm,
Our joys would quickly fade,

Accompany us, but mortal sons,
 As transiently we sail,
 Thro' all th' advent'rous paths of life,
 And thro' its dreary vale.

CLERICUS.

THE RETURN OF WAR ANTICIPATED.

AGAIN grim death equips his iron car,
 And shakes the world with a tremendous jar ;
 Again shall joy be swallow'd up in woe,
 And tens of thousands feel the barbed blow.
 Unkennell'd now war's surly bloodhounds yelp,
 And timid nations cry aloud for help.
 Once more we see the black'ning tempest rise,
 And dreadful omens veil our happier skies ;
 And oh ! strange change of sublunary things !
 We mark the fall of Provinces and Kings.
 O flattering Peace ! say why didst thou beguile
 Our grateful hearts with thy fallacious smile ?
 Why lure thy vot'ries to thy downy breast,
 So soon to mourn the absence of thy rest ;
 So soon to see thee quit the neighbouring shore,
 And in thy stead behold destructive war.
 For we had hop'd to see the landscape bloom,
 And plenteous corn fields shed a rich perfume :
 We hop'd to see Pomona strew the ground,
 Where heaps of slain, and martial stores were found.
 But oh ! dread war, thou cramp'st th' industrious hand,
 And devastation spread'st throughout the land :
 Where thou pervad'st improvement takes her flight,
 And all around is wretchedness and night.
 Witness, O Spain, the desolating hour
 Where erst fair Flora deck'd her beauteous bow'r ;
 Where erst the scorched turf was clad in green,
 The goaded steed was on the mountain seen.
 Attest, O Germany, the direful tale ;
 Let thy keen sufferings and thy wrongs prevail :
 And mourn, oh ! mourn, the dark foreboding hour
 That threatens you with tyrannizing power.
 Ah ! horrid war, when shall your slaughter cease,
 And Europe share a permanent release :
 When shall the bloody ensign cease to flow,
 And Kings and States in social union grow.

When shall the martial feat be all a sham,
 And men of prowess like the harmless lamb.
 Are there no ties to bind the tyrant down?
 No arms to keep the once dear rescued crown?
 The muse upbraids you, O ye great Allies;
 Whilst you debate, the lynx-ey'd tyrant flies,
 And tells the world what men had long foretold,
 That bonds of peace the despot cannot hold.
 Ye Gauls, have ye forgot the Northern war,
 Which brought the Cossack to the Frenchman's door?
 Like Pharaoh's scatter'd host your legions fell,
 And few return'd the doleful tale to tell.
 Defeat unparalleled—Napoleon fled
 From thousands wallowing in their frozen bed;
 Where sword and pestilence, where famine rag'd,
 And blood and fire their desperate strength engag'd.
 Alas! what further ills shall Europe know,
 What new invasions—what fresh scenes of woe;
 What dark atrocities in embryo laid,
 To pillage towns, and dispossess the glade?
 What new embargoes shall our commerce mar,
 And far from home detain the British tar?
 How like a dream the short cessation's flown,
 Which shew'd us pleasures not to be our own:
 How like a tale that calms the troubled mind,
 But leaves a load of sorrows far behind.
 Mark then, fair *Visitors*, the moral here,
 And let your peace be in a higher sphere:
 For temporal bliss and hopes shall flee away,
 Like summer dew-drops in the solar ray:
 And this short pilgrimage shall still remain,
 Subject to errors, casualties, and pain.

Hull, April 14th, 1815.

T. E. ABBOTT.

Answers to Queries.

(54) Answered by Mr. BENJ. FARROW, *Hull*.

LIGHT must be a reality, and, shade no substance; therefore, shade cannot move a substance. That there are *luminous* bodies in nature, and *artificial* bodies also, is evident; but they are all local: the very sun itself is *locally* confined to our system. Yet light is boundless—“its centre is every where, and its circumference is n

where ;" therefore, light cannot move ; for, should light move with that *overwhelming speed*, what confusion it would cause in all systems ; but the greatest order and harmony pervade the whole. The motion of the earth causes day and night ; and if we had not rays of light in winter nights, no luminous bodies could strike upon them. Was not the globe of hot iron rather moved by the cold air received into it, than any thing else ? Great men are not always right. Galileo, of Tuscany, dared differ from the sages of his time ; but time proved that he was right, and they were wrong. Let the question of light be considered without partiality, for the sake of naked truth ; and it will triumph over every obstacle, and establish its consequences.

Of nearly the same opinion is *Mr. Omond*, of Withernsea.

The same by Mr. LAMPLUGH, Walkington.

THOUGH the vicissitudes and mutations of the properties of matter are many, and variously effected, yet matter will for ever remain matter, after all the modes and properties which constitute its colour, shape, quality, &c. are transfigured and destroyed. There is no possibility of matter ever being augmented or annihilated.

Light consists of an inconceivably great number of particles, flowing from a luminous body in all possible directions, and momentarily proceeding to some part of space ; where, after reflecting and re-reflecting, it loses its luminating faculty, and, like the blaze or flame of fire, when extinguished, remains in a state imperceptible, and not to be comprehended by mortals.

(54) *Answered by Mr. BAINES.*

I BELIEVE it is not true that willows only grow in low watery grounds ; but that they thrive better there than any where else, cannot be doubted. I have, in many instances, observed them (particularly the female) growing in elevated situations, though I confess not on the tops of *hard and dry mountains*. The circumstance mentioned in the query, is a solitary instance, and may perhaps be

accounted for by considering that water is not so essentially necessary for the vegetation of plants and trees, as is sometimes imagined. Air and earth, but particularly air, is the principal food of plants ; and it may be the kind of air which is common in watery grounds, that conduces so much to the growth of willows in those places.

The sawe by Mr. OSMOND, Withernsea.

IT appears evident that flints, stones, chalks, marl, &c. have all the nature of clay ; and wherever there is a heap of those bodies, there arises a moisture of this nature. A substance of any sort will produce heat, be the mixture what it may, if there be any hard body in it Pure earth has not ever yet been seen : for if we take up a quantity of what we term earth, it is not earth alone ; it is a composition of different qualities ; air, earth, fire, and water.— And upon this wold, where this surprising willow is growing among flints and stones, there certainly arises a moisture occasioned by the natural digesting exudation from the stones, which is the nature of the earth. Indeed I believe a stone that lies upon the surface of the ground, part of it in the earth, gradually increases. /

(56) Answered by Mr. WATERLAND.

WHEN the wind blows for any considerable length of time from the North or North-East, it brings with it much of the cold with which it had been impregnated in the Northern regions, and consequently must be much colder than the South and South-West winds, which are continually bringing air from warmer climes. But that an East wind, in this island, should be colder than one from the West, seems to be owing to its local situation. It is generally allowed, that the wind in passing over tracts of land, covered with vegetables, acquires a greater degree of cold than in passing over the same space covered with water ; consequently the West wind, by blowing from off the Atlantic Ocean, is less cold than the East wind, which passes over the European Continent, and has its rigour but little moderated by passing over the German Ocean, that sea being comparatively but of small extent.

The same by Mr. GEORGE LENG, Hull.

THE North pole is the parent of cold—the wind thence having to pass over the Frozen Ocean, and part of the continent of Europe, is the occasion of its being so cold with us: the North, North-East, &c. wind is colder upon the continent of Europe, in the same parallel of latitude, than with us; it loses a great deal of its coldness by passing over the German Ocean. The South wind is also the warmest, on account of its being rarefied in the torrid zone, and coming from a country warmer than ours.

Answers were also received from *Messrs. Baines and Osmond.*

(57) *Answered by Mr. BAINES.*

In frosty weather the atmosphere is colder than unfrozen water; but when the weather is open, water is the colder of the two; so that to a superficial observer, the assertion in the query may seem correct. In the former case, the atmosphere will absorb more caloric from the human body than the water, which is in consequence conceived to be warmer; but in the latter, the contrary will be the case; nevertheless, it is plain, the temperature of the water will be greater in open, than in frosty weather.

The same by Mr. GEORGE LENG.

WATER is not warmer in frosty weather than at other time: it is the different temperature of the atmospheric air which is the cause of its feeling warmer. Water comes from the bowels of the earth, and brings the natural temperature along with it, equally warm in winter as in summer; it is the variation of the external air that is the cause of its seeming to be warmer in frosty weather. I have seen some springs in frosty weather (to use the common phrase,) smoke, which I account for thus: the vapour that arises from the water as it issues from the earth, is quickly condensed by the cold external air which arises from it like a thick fog.

Also answered by Mr. Osmond.

(58) *Answered by Mr. BAINES.*

RAYs of light differ in their disposition to exhibit this or that particular colour; some are disposed to exhibit a red colour and no other, some a green, others a blue, &c. This being premised, the query will receive considerable elucidation by applying to it the nature and properties of inflected light, viz. that light is attracted towards several delicate substances, which becomes conspicuous when its rays pass within a certain distance of their surfaces, and being bent, are separated into colours by the vicinity of the substance; and this produces the singular phenomenon of various coloured fringes, which accompany the inflection. This I think sufficiently accounts for silks, the feathers of peacocks' tails and pigeons' necks, and the webs of some spiders appearing of different colours when viewed in different positions.

Answered also by Mr. Osmond.

(59) *Answered by Mr. BAINES.*

If the word Committee were spelt with only one *e*, analogy would teach us to pronounce it in the same manner as Gazette, Mignonette, Calotte, Charlotte, &c. therefore, I am of opinion that the present method of spelling it is preferable to that suggested by the proposer.

Mr. Osmond thinks differently.

(60) *Answered by Mr. ATKINSON, Heskett School.*

AT the foot of mount Arat, in Arabia, formerly dwelt a man, the wealthiest of all the Princes of his age. By a wonderful train of circumstances, he was reduced from the highest state of grandeur and happiness, to the lowest degree of poverty and distress: his fate became a proverb. The expression was introduced to England by the Jews. By some means the accent was changed; and the good people of England converted Arat into "a rat."

(61) *Answered by Mr. WATERLAND.*

THE sensation called edging the teeth is produced in two different ways. 1st. By the application of acids, as eating a sour apple, &c. This is owing to the action of the acid upon the enamel of the teeth, which it has a tendency in time completely to destroy. This action

causes a roughness upon the surface of the teeth, which, by their friction, then act like a file against each other, and cause vibrations in the extremities of the nerves which rise in the teeth, and produce the above sensation. 2ndly. By harsh disagreeable sounds. This is accounted for by the auditory nerve having a communication with the nerves which supply the teeth; as the third branch of the fifth pair goes to supply the teeth and the tympanum: and edging the teeth, from this cause, is probably occasioned by those very harsh sounds producing a violent tremor in the tympanum, which is conveyed by the above-mentioned communication to the teeth. On the same principle, we may account for the very strong idea of sound which a person has who holds a vibrating string between his teeth.

Mr. Baines also answered this query.

Grammatical and Philosophical Queries.

(62) *By AGRICOLA.*

REQUIRED the derivation of the word *Tyburn*.

(63) *By Mr. BAINES, Jun.*

THE direction of the wind always changes in our climate either at the approach, or during a thunder storm: what reason can be assigned for it?

(64) *By Mr. OSMOND, Withernsea.*

THE sensation, called the fingers tingling, may be remedied by holding the hands two or three minutes in cold water: how is this remedy to be accounted for?

(65) *By Mr. WATERLAND.*

WHAT is the cause of that tremulous undulatory motion observable in the air in hot weather?

(66) *By the same.*

WHY does blood coagulate when drawn from the body?

(67) *By Mr. WATSON, Beverley.*

IN Minsters, and ancient Churches, there are many small ridiculous images, (some of which would move the sturdy muscles of a Pope with risibility) : required their indication and origin.

Answers to Mathematical Problems.

(94) *Answered by Mr. WHITLEY, Rotherham.*

FROM the centre M, with the radius MT, or MP, describe the arc. PTp, cutting the line OP (O being the centre of the given circle) again in p; join OT, and demit, on OP, the perp. MD. Since OTM is a right angle, OT is a tangent to the circle PTp, at T; therefore $OP \times Op = OT^2$; but OT and OP are given; hence Op is given: whence as DP = Dp, D is a given point; consequently the locus of M is the right line DM given in position.

Also by *Messrs. Baines, Burdon, Chapman, Darby, Gawthorp, Harrison, J. Lamplugh, M. Lamplugh, Mair, Page, and Yorke.*

(95) *Answered by Mr. GAWTHORP, Leeds.*

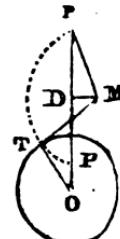
LET a^2 be the given square, and x = one part; then will $a^2 - x$ be the other, and $(a^2 - x)^3 + x^3 = a^6 - 3a^4x + 3a^2x^2 = \square = a^3 - anx^2$, by assumption; hence $x = (2a^2n - 3a^2) \div (n^2 - 3)$, and $a^2 - x = (a^2n^2 - 2a^2n) \div (n^2 - 3)$; n may be taken at pleasure, if greater than 2.

If $n = 4$, the parts are $\frac{5}{12}a^2$ and $\frac{8}{12}a^2$. If $n = 5$, they are $\frac{7}{25}a^2$ and $\frac{18}{25}a^2$.

In a similar manner was this problem answered by *Messrs. Ambler, Baines, Darby, Glendenning, Harrison, Robt. Law, Mair, and Whitley.*

The same by Messrs. Lamplugh, Page, and Youle.

ANY square number divided into two equal parts will have the sum of the cubes of these parts a square: for put



x^2 = the given square number; then $\frac{x^3}{2}$ and $\frac{x^3}{2}$ are the two parts, whose cubes are $\frac{x^6}{8}$, and $\frac{x^6}{8}$; but the sum of these is $\frac{x^6}{4}$, a square.

(96) *Answered by Mr. MAIR, Teacher of the Mathematics, Barton; and Mr. AMBLER, Eaton Bishop, Herefordshire.*

LET $r = \sqrt[5]{1.05} = 1.00093869$ = one pound, and its interest for one week, $p = 6s. = .3\mathcal{E}$, $t = 2080$ weeks in 40 years, and pr = the amount of 6s. for one week, which must be considered as an annuity; then $\frac{r^t - 1}{r - 1} \times pr = 1931\mathcal{E}. 18s. 11\frac{1}{4}d.$ the amount.

Also by *Messrs. Baines, Chapman, Darby, Goodison, Harrison, Killingbeck, G. Leng, Lamplugh, J. Tadman, Tindall, Watson, Wilkinson, and Wiseman.*

(97) *Answered by Mr. KILLINGBECK, Barton-le-Willows; Mr. WATSON, Beverley; and AGRICOLA, Wethorp.*

THE equations reduced become $4y^3 + y^2 - 4xy - 4x^2 = 32$, and $y^3 - y - xy - x^2 = 0$: four times the last equation taken from the first, gives $y^2 + 4y = 32$; $\therefore y = 4$, and $x = 6$.

Also by *Messrs. Ambler, Baines, Chapman, Darby, Harrison, Lamplugh, G. Leng, Mair, Smith, J. Tadman, Wilkinson, and Wiseman.*

(98) *Answered by Mr. GOODISON, Eaton Bishop; and Mr. TODD, Houghton, near Weighton.*

THE side of the octagon = $8 \div 4.8284271 = 1.65685426$, the square of which multiplied by $4.8284271 = 13.2548336$ square chains = 1A. 1R. 12P, the area required.

Also by *Mess. Agricola, Ambler, Baines, Chapman, jun. Darby, Harrison, Killingbeck, Lamplugh, G. Leng, Mair, Smith, J. Tadman, Watson, and Wiseman.*

(99) *Answered by Mr. HENDRY, Hull.*

PUT $r = 1.05$; then $\frac{1}{r} + \frac{1}{r^2}$, &c. to $\frac{1}{r^{60}} = 18.92928953$, present value of £1 annuity for 60 years, and $18.92928953 \times 350 = 6625.2513355$, value of the first offer.

Again $\frac{1}{r} + \frac{1}{r^2}$, &c. to $\frac{1}{r^{20}} = 12.46221034$, and $12.46221034 \times 300 = 3738.663102$, value of the estate for the first 20 years; $\frac{1}{r^{21}} + \frac{1}{r^{22}}$, &c. to $\frac{1}{r^{40}} = 4.69687597$, and $4.69687597 \times 350 = 1643.9065895$, value of the estate for the second 20 years; and $\frac{1}{r^{41}} + \frac{1}{r^{42}}$, &c. to $\frac{1}{r^{60}} = 1.77020314$, and $1.77020314 \times 400 = 708.081256$, value of the estate for the third 20 years: the sum of these three values is = 6090.6509475, the value of the second offer; consequently the difference between the values of the two offers = 534.600388 £. = 534 £. 12s.

The same by Mr. BAINES, Jun. Reading.

By table 3. p. 196. Joyce's Arith. $18.92929 \times 350 = 6625.2515$, the present worth of a rent of 350 £. to continue 60 years. And $12.46221 \times 300 = 3738.663$ the present worth of 300 £. to continue 20 years, $(17.159086 - 12.46221) = 4.696876 \times 350 = 1643.9066$, the present worth of the second 20 years, and $(18.92929 - 17.159086) = 1.770204 \times 400 = 708.0816$, the present worth of the third 20 years; hence $3738.663 + 1643.9066 + 708.0816 = 6090.6512$ = the value of the latter proposal; therefore $6625.2515 - 6090.6512 = 534.6003 £.$ the difference in value of the two offers, the first being the more advantageous.

Mr. HARRISON, after solving this problem by various methods, says, that nothing more is necessary than to find the difference of the values of an annuity of 50 £. to continue 20 years, to be entered upon immediately, and one of 50 £. to continue the same time, but not to be entered upon till the expiration of 40 years. The value of the

former he makes 623,110517, and of the latter 88.51057, the difference of which is 534.60031, agreeing with the above results.

Also by *Messrs. Ambler, Darby, Goodison, Lamplugh, G. Leng, Mair, J. Tadman, Wilkinson, and Wiseman.*

(100) *Answered by Mr. BAINES, Jun. Reading.*

SUPPOSE $(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$ = the number to be extracted; now it is evident that the value of a is ten times its integer value; and, therefore, $3a^2$ will be $300a^2$, for the divisor, the root of the first term being a ; it is also evident, the three terms of the subtrahend will be $300a^2b + 30ab^2 + b^3$, the same as in the rule. Q. E. D.

Also by *Messrs. Darby, Harrison, Leng, Lamplugh, Mair, and Watson.*

(101) *Answered by Mr. AMBLER, Eton Bishop; and Mr. DARBY, Sutton.*

LET x and y represent the length and breadth of the rectangular field, or the major and minor axis of the inscribed ellipsis; then, per problem, $4x-y = 3\sqrt{x^2+y^2}$, and $.7854xy = 392.7$, or $xy = 500$; $\therefore y = 500 \div x$. This value of y substituted in the first equation, &c. there results $x^4 - \frac{4000}{7}x^3 = \frac{2000000}{7}$; whence $x = 29.863$ chains and $y = 500 \div 29.863 = 16.743$.

Also by *Messrs. Agricola, Baines, Chapman, Goodison, Harrison, Killingbeck, Lamplugh, G. Leng, Mair, J. Tadman, Tindall, Watson, and Wiseman.*

(102) *Answered by Mr. WISEMAN, Hull.*

LET x be the distance from the less light; then $m-x$ will be the distance from the greater; and $\frac{1}{x^2} + \frac{n}{m-x}^2$

will denote the quantity of light, a *minimum*; $\therefore -\frac{2xx}{x^4} +$

$\frac{2nx \times m-x}{m-x^4} = 0$; hence $n \div m-x^3 = 1 \div x^3$, and

$\frac{nx^3}{m-x^3} = \frac{1}{1+\sqrt[3]{n}}$; $\therefore x^3\sqrt[3]{n} = m-x$, and $x = \frac{m}{1+\sqrt[3]{n}}$.

The same by Mr. BURDON, Acaster Malbis.

PUT x = the required distance from the less candle; then, by the prob. $\frac{n}{m-x^2} + \frac{1}{x^2}$ = a minimum; the fluxion of which put = 0, and the eq. reduced gives $x = \frac{m}{\sqrt[3]{n+1}}$.

If a person describe a circle, the radius of which is $\frac{m}{n-1}$ $\times \sqrt{n}$, and its centre at a distance = $\frac{m}{n-1}$, from the less candle, in the prolongation of a right line joining them, he will receive an equal quantity of light from each candle in every part of his journey.

Also by *Messrs. Agricola, Baines, Darby, Harrison, Killingbeck, Lamplugh, Mair, and Smith.*

(103) *Answered by Mr. WHITLEY, Rotherham.*

THE hypotenuse (5) and one leg (4) of a right angled triangle being given to find the angle included between the two hands = $36^\circ 52' 12'' = 36.87$ deg. which put = a , also $b = 60^\circ$ = the L included between the 12 and 2 o'clock lines, $x = L$ contained by the 2 o'clock line and the hour hand at the time required; then will $b + x + a = L$ contained by the 12 o'clock line and the minute hand at the same time. As the minute hand moves through the circumference, while the hour hand moves through $\frac{1}{12}$ of the same; $\therefore 1 : \frac{1}{12} :: b + x + a : x$; hence $12x = b + x + a$, and $x = \frac{1}{11} b + a$. But the hour hand moves through 30° in 1 hour, or 60 m.; theref. $30^\circ : 60' :: \frac{1}{12} (b + a) : \frac{1}{12} (b + a) = 4$ min. 12 sec., or 17 min. 36 sec. after two o'clock, the time required.

The same by Mr. WISEMAN, Hull.

As $5 : 4 :: 1 : 4 \div 5 = .8 = \cos. 36^\circ 52' 10''$ the dist. between the hands. Put x = dist. from 2 of the hour hand; then 12 x will be the dist. of the minute hand from 12.

and $12x + 36^\circ 52' 10'' = 60^\circ + x$, or $11x = 60^\circ + 36^\circ 52' 10'' = 23^\circ 7' 50''$, or $96^\circ 52' 10''$; whence $x = 2^\circ 6' 10''$, or $8^\circ 48' 23''$; therefore $360^\circ : 1 \text{ hour} :: 12x : 4 \text{ min. } 12\frac{1}{2} \text{ sec. or } 17 \text{ min. } 36\frac{1}{2} \text{ sec. past two, the time required.}$

Nearly in the same manner was this problem answered by *Messrs. Burdon*, and *Lamplugh*. Ingenious answers were also received from *Messrs. Baines, Darby, Harrison, Killingbeck, Mair, J. Tadman, Todd, and Wilkinson*.

(104) *Answered by Mr. GOODISON, Eaton Bishop, Herefordshire.*

For 42, read 2, in the Problem.

LET $x = 3$, $x = 1$, $x + 1$ and $r + 3$ denote the sides of the trapezium; then, vide Hutton's Dict. 15 prop. of the trap. $x^4 - 10x^2 = 3591$; when $x = 8.0705$; hence $5.0705, 7.0705, 9.0705$, and 11.0705 are the sides. Again, for the diameter of the circumscribing circle put y ; then 16th prop. ibid $\sqrt{(5.0705 \times 7.0705 + 11.0705 \times 9.0705) \times (5.0705 \times 11.0705 + 7.0705 \times 9.0705) \times (5.0705 \times 9.0705 + 11.0705 \times 7.0705)} \div 2y = 60$; $\therefore y = 11.8442$.

Mr. Burdon's solution is nearly the same as the above.

Also answered by *Messrs. Ambler, Baines, Darby, Harrison, Killingbeck, Lamplugh, Mair, J. Tadman, Wilkinson, and Wiseman*.

(105) *Answered by Mr. BURDON, Acaster Malbis.*

LET r denote the rad. of the sphere; then, by trig. 1 : $r : \text{tang } 60^\circ (= \sqrt{3}) : r\sqrt{3} = \text{rad. of the base of the circumscribing equilateral cone, and } 3r = \text{its perp. alt.}$ Hence the solidity of the sphere $= 8r^3 \times .5236$, of the circumscribed cylinder $= 8r^3 \times .7854$, and of the circumscribed equilateral cone $= 4r^3 \times 3 \times .7854$, which are as the numbers 4. 6. 9.—Q. E. D.

The same by Mr. BAINES, Reading.

Put d = the diam. of the sphere, and n = 2618; then it is well known that $d\sqrt{3}$ will express the diameter and $\frac{1}{3}d$ the alt. of the circumscribing equilateral cor

but $2 d^3 n$, $3 d^3 n$, and $\frac{4}{3} d^3 n$ will express the solidities of the sphere, cylinder, and cone, which are obviously as the numbers 4. 6. and 9.

Also by *Messrs. Agricola, Ambler, Chapman, Darby, Goodison, Harrison, Killingbeck, Lamplugh, Mair, Tindall, Watson, and Wiseman.*

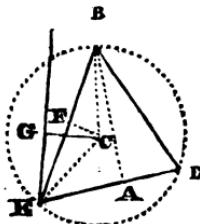
(106) *Answered by Mr. BAINES, Jun. Reading.*

LET B, D, and E, represent Berwick, Dover, and the Land's End; let fall the perp. BA, and find the centre C of the circumscribing circle, which will be equally distant from the three angular points.

Calcul. With the lat. and long. of Dover, and the Land's End, find, (by Mercator's sailing) the dist. $DE = 274.87$ geographical miles; with the lat. and long. of Dover and Berwick, find the dist. $BD = 305.37$; and with the lat. and long. of Berwick and the Land's End, find the dist. $BE = 367.71$, and the course, or $\angle BEG = 20^\circ 41' 40''$.

Now $DE : BE + BD :: BE - BD : AE - AD = 152.6$;
 $\therefore AD = 61.11$, and $\sqrt{BD^2 - AD^2} = AB = 299.19$;
 but $BD \times BE \div AB = 375.3$ = the diameter of the circumscribing circle; hence the radius $BC = CE = 187.65$, and $BF = FE = 183.855$; $\therefore \sqrt{CE^2 - FE^2} = FC = 37.55$; whence the $\angle CEF = 11^\circ 32' 34''$; \therefore the $\angle CEG = 32^\circ 14' 14''$, from which GE is found = 158.7 = $2^\circ 39'$ nearly, the difference of lat. from the Land's End; hence the lat. of the place is $52^\circ 43' N.$; and, by Mercator's sailing, the difference of long. from the Land's End is = $160.4 = 2^\circ 40'$ nearly; therefore the long. of the place is $3^\circ 2' W.$, which place is on the borders of Wales, between Welshpool and Shrewsbury.

Also, in the same manner, by *Mr. Geo. Leng, Hull.*—
*Mr. Mair, of Barton, answered this problem by spherical analogies, and made the lat. and long. of the place $52^\circ 43' 23'' N.$ and $3^\circ 3' 10'' W.$ —as did also *Messrs. Garrison, and Wilkinson, of Hull.**



New Mathematical Problems.

(109) *By J. CHAPMAN, Jun. Hull.*

IN reply to Jack's vows, and fond inclinations,
 His Cloe has sent him these * knotty equations ;
 In which y and x , as I thence understand,
 Shew the month and the day when she gives him her hand.
 Now some in such matters their talents display,
 But faith my friend Jack is not gifted that way ;
 So beg you'll inform him as soon as you can,
 When this puzzling fair one will make him her man ;
 When jointly they both shall be measures concerting,
 Without all this head-work, and much more diverting.

$$\begin{aligned} * x + x^2 y + x^3 y^2 &= 111756 \\ x^2 + y^2 &= 208. \end{aligned}$$

(110) *By Mr. GEORGE LENG, Hull.*

REQUIR'D the value of x , when $\sqrt{\frac{1}{2}} x^{\frac{3}{2}}$ is a minimum.

(111) *By Mr. AMBLER, Eaton Bishop.*

A GENTLEMAN has a field in form of a right-angled triangle, the hypotenuse being 350 yards, and one of the angles = $36^{\circ} 52' 12''$; what will be the length of the longest line possible running from one of the angles to the opposite side to divide it into two equal parts, without finding the sides of the triangle ?

(112) *By Mr. CHAPMAN, Hull.*

GIVEN $x y^2 + y = 1953$, and $x^2 y^4 + y^2 = 3779217$;
 required the values of x and y by a quadratic equation.

(113) *By Mr. GOODISON, Eaton Bishop.*

A FARMER wishes to have an oak roller, whose diagonal shall be four yards. such, that in turning once round, it may roll the most land possible. Please to find its length, and diameter of its base.

(114) *By Mr. BURDON, Acaster Malbis.*

A PERSON having occasion to cross a field, the diameter of which is thirty chains, wishes to call at a house, which is nine chains distant from the centre. On one side

the house he can walk at the rate of four miles an hour; but on the other only three miles an hour. Required the area of each part of the field, divided by the path he describes, when he performs his journey through the field, in the least time possible.

(115) *By Mr. KILLINGBECK, Barton-le-Willows.*

INTO a cone, whose altitude is 32, and diameter of its base = 120, are put two globes the greatest possible; which, when just immersed, come in contact with each other; then the superficial content of the greater globe is equal to 256 times the superficies of the less. Find the size of the globes.

(116) *By Mr. LAMPLUGH, Walkington.*

THE sum of the three sides of any plane triangle is to the area of the triangle, as the periphery of the inscribed circle is to the area of the inscribed circle: required a demonstration.

(117) *By AGRICOLA, Wethorp.*

A CERTAIN gentleman has a cylindrical tub in his garden, whose diameter is 48 inches, and alt. 24. Now if it be half filled with water, what would be the diameter of a heavy sphere, which, when immersed therein, may be just covered?

(118) *By Mr. DARBY, Sutton.*

REQUERED the declination of the sun, when he sets at Yap, in lat. 10° N. long. 139° E. and at St. Juan, in lat. 28° N. long. 147° E. at the same time.

(119) *By Mr. BAINES, Reading.*

Two ships sailed from two different ports, the one 68 miles South of the other, to a port lying between the S. and W. When they arrived at it, it was observed that the courses steered by the two ships formed an angle of 18° at the port; and that the diff. of lat. was the greatest possible. Required the courses, distances, and difference of lat. of each ship.

(120) *By Mr. WISEMAN, Hull.*

SUPPOSING the earth an ellipsoid of revolution, and that its motion round its axis was stopped; what effect would this circumstance have on the weight of a person, previously weighing 12 stone, in the latitude of Hull, $53^{\circ} 45'$?

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Vol. II.

**ESSAY ON THE UTILITY OF MATHEMATICAL
LEARNING.**

(Concluded from our last.)

II.—I shall next attempt to shew some of those advantages which accrue to mankind in general from the cultivation of the Mathematics. And first, let it be observed, that the Mathematical Sciences constitute the greatest and most important part of human learning. Of the seven sister arts of noble birth and genteel demeanour, four walk in the train of Mathesis: Arithmetic, Geometry, Astronomy, and Music. The first two are *purely* Mathematical, being conversant about number and magnitude, and claim precedence, not only on account of their extreme and absolute utility, but because they are the proper foundation of the rest. When these are applied to particular branches of science, as to Astronomy, Geography, or Navigation, they then assume the name of *mixed* Mathematics; and here Philosophy, and Mathematics her sister, go hand in hand, and conduct us to the most noble and sublime secrets of natural things. Besides what are properly termed pure and mixed Mathematics, there is another branch of Mathematical study which is called *speculative*, being merely the investigation of truths, or true propositions, without applying them to any useful purpose. But to conform to that order and method which my subject so naturally enjoins, I shall first inquire to

what utilities of life *pure* Mathematics contribute ; in the second place, endeavour to trace some faint outline of that nobler walk, in which Philosophy accompanies her helpmate through the regions of universal nature ; and lastly, point out the advantage or propriety of those studies that seem to possess no apparent utility in themselves, but to be entirely of a speculative nature.

1. And *first*, in regard to those sciences which teach us the various properties of number and magnitude abstractedly ; as they must have received the earliest attention of mankind from their absolute and general utility ; so do they on the same account in all ages demand the first application of human genius, and as well because they are the proper foundation for its future acquirements. Though some part at least of Arithmetic, or the art of numbering, must have been known in the first ages of men, and the fundamental rules most probably in all ages by some nation or other ; yet the present improved method of notation by Arabic numerals can boast of no great antiquity amongst Europeans. They have, however, given such a facility to the acquisition and extension of this science, that whilst its general laws and ordinary operations are reduced to the level of infantile capacity, the science itself is brought to a degree of excellence which the ancients could never hope to see it attain, and which we can hardly expect to see materially improved. The invention of Logarithms would seem to have completed the system. If any science can be said to have reached its utmost height, it is Arithmetic ; as if it were designed by the author of all knowledge, that that science, which is the basis or the instrument of other sciences, should, in order to facilitate the progress of human genius, soonest gain its destined point of perfection. As the foundation or instrument of Mathematical learning, the service of Arithmetic is of inestimable value. To those branches which depend not on Geometry alone, it is indispensable ; and there is hardly any branch to which its aid is not in some manner required, whilst itself requires the assistance of no other science whatever. But the subserviency of Arithmetic to the Mathematics in *general*, though of infinite utility, is not its only excellence. Its use and importance are recognized in all the active

employments of life. Without it no business can be transacted either at home or abroad: no trade or commerce can be carried on without the aid of numbers. No wonder then, if in this country, from the nature and extent of her commercial connexions, Arithmetic has acquired a more than ordinary share of public esteem and private estimation. As Arithmetic is the foundation of every thing in Mathematics that relates to numbers, so is Geometry of every thing that contemplates the properties or extension of magnitude. In practical utility, however, Geometry must be allowed to be inferior to Arithmetic: it is true, indeed, that it leads to more noble inquiries, and more sublime discoveries; but its speculations are pursued with an infinite variety, that precludes the hope of ever bringing this science to perfection; and in applying its propositions to practical purposes, it requires the aid of numbers to complete them. The primary use of this science, as the name Geometry implies, was to measure the surface of the earth, or any distances or dimensions upon it: it afterwards became a general term for the measure of magnitude universally. The arts rose as necessity, and, consequently, utility, gave them birth; and that of measuring is generally believed to have derived its origin from the annual inundations of the Nile. The useful purposes to which pure Geometry is applicable, are the measurement of lands, of heights, and distances, the surface, solidity, and capacity of bodies of every form, and the construction of them, with the proportion which numbers and magnitudes bear to each other, or the doctrine of ratios. Architecture too, as a fine art, appears to be purely geometrical, so far as it depends upon science. In most practical purposes, Arithmetic and Geometry go hand in hand, deriving mutual aid from each other. Geometry cannot complete its operations without numbers; and Arithmetic, if it has not borrowed the invaluable rules of proportion from Geometry, has had its bounds infinitely enlarged and extended by it.—I must not forget to mention another science under the character of pure Mathematics, which, though of later birth, and of less practical utility in life than Arithmetic and Geometry,

has extended the former to an unlimited application, and has even surprizingly enlarged and improved the latter; I mean Algebra, the science of universal quantity, or universal Arithmetic. In extent of application, this science far surpasses Arithmetic and Geometry: the latter two are chiefly fundamental sciences, but Algebra not only investigates rules and theorems of its own, but by an admirable analysis, extends to every other branch of Mathematical learning where truth is sought; solving with accuracy, brevity, and elegance, the most abstruse and difficult problems. Its proper business, indeed, is rather to apply by analysis the fundamental principles of science to the investigation of problems in any particular branch, than to establish any practical laws of its own.

2. We are next to endeavour to trace the progress and utility of Mathematical studies, combined with those of Philosophy; and though the extent of this research is limited only by the universe itself, yet it must be acknowledged that he who has not accompanied these sciences through that research, can hardly be entitled to the name either of Mathematician or Philosopher. Mathematics and Philosophy are so nearly allied, as even to have been inseparable. How much the former were cultivated by the ancient Philosophers, will appear from such of their works as are extant. Plato held Mathematical studies in such esteem, that he had over the door of his Academy, an inscription to this effect: *let no one who is ignorant of Geometry enter this place*: and the Mathematicians that issued from his Academy were almost innumerable. And if these sciences were so highly venerated in ancient times, how much more are they now worthy of reverence, after the profound discoveries to which they have been so highly instrumental? What Pythagoras learnt from the Eastern Magi, and believed to be the true system of the world, had never yielded to the fallacious theories of Ptolemy and Tycho, had it been exhibited to mankind by the proofs of Mathematical demonstration.

The science in mixed Mathematics that first claims our attention, both for antiquity and dignity, as well as for its utility, and the advantages it affords to human life, is *Astronomy*. Its antiquity is such, that no period can be assigned for its origin; and such is its dignity, that the

study of it has filled even Kings and Emperors with delight. But its highest excellence consists in this; that it gives us more just and worthy conceptions of the being and attributes of God, than any other science attainable by the mere light of nature. It is here that Geometry, leaving the narrow limits of our earth, which is but a speck in the vast creation, ascends to the heavens, numbers the stars, computes their magnitude and distances from each other, and from us, ascertains the orbits and periods of the planets, and the nature of that universal law, which preserves the order and harmony of the universe. All the various phenomena of the heavens are most clearly accounted for by this delightful science; the latitude and longitude of the stars, the eclipses of the sun and moon, the transits of the planets, and even the eccentric path of the devious comet, is correctly traced out, so as to determine the exact period of its return to us. The sagacious Kepler discovered that the orbits of the planets are elliptical, that they describe equal areas in equal times, and by comparing their distance with their periods, he found out by computation, that the squares of their periodical times are as the cubes of their distances from the centre of their orbits; and the same law was found to obtain in the revolution of the secondary planets around their primaries; but the reason of this law remained a profound secret, till the immortal Newton, investigating it from its proper cause, demonstrated its physical necessity. He has shewn that whenever bodies turn round each other and describe equal areas in equal times, as observations teach us the earth and sun do, that one must gravitate to the other: and that when they do not approach each other in a straight line, they must turn round a common centre of gravity. But the sun being so large a body in respect of the earth, their common centre of gravity must be in the sun, round which, therefore, the earth necessarily revolves. And hence all the planets gravitate towards the sun: and the grand law of attraction that pervades the universe, he discovered to be this: that the particles of matter attract each other in a reciprocal duplicate proportion of its

distance. Thus we see how Geometry and Philosophy render mutual help to each other, in the discovery of truth, and the advancement of the sciences.

The practical advantages derived from the study of this noble science are numerous and important. Geography, Chronology, and Navigation, are all indebted to its discoveries. By the aid of Astronomy, the Geographer ascertains the true figure of the earth, and the situation and distance of places upon it; whilst the Chronologist learns from it the true measure of the year, and can give an account of actions according to the true order of the times in which they happened, and then settle the principal epochs of history. But to no art has Astronomy afforded so important facilities and improvements as to that of Navigation. The mariner, no longer obliged *to observe the rising and setting of the ancient stars*, has his course over the wide and trackless deep regulated by more certain means—the latitude and longitude of places. The former is attainable from the sun's meridian altitude alone; but the latter had long been an important desideratum in the art of Navigation, and had even been considered by some Mathematicians of no mean repute as a profound secret, which they never hoped to see accurately discovered. With the ancient Philosophers, who had little or no recourse to experiment, to support or confirm their various hypotheses, this noble secret could hardly be expected to be brought to light. But as natural Philosophy and Mathematics advanced in their progress, and the minds of men became more and more excited by new discoveries, experiments were resorted to for the purpose of gratifying curiosity, or of establishing theory: and hence the invention of optical instruments, which have contributed so highly to the perfection of Astronomy. By the introduction of telescopes it was, that Galileo discovered, amongst other phenomena, the ring of Saturn, the revolution of the sun on his own axis, and the satellites of Jupiter; and from repeated observations of these last, some time after, an attempt was made to determine the longitude of places on the earth. The great length of time that elapsed before these instruments were brought to the due degree of perfection, still prevented this method of

ascertaining the longitude from being of much practical utility ; and even at this day it is seldom had recourse to with advantage *at sea*, on account of the influence which the ship's motion has upon the accuracy of the observation. A new method of ascertaining the longitude was projected early in the sixteenth century, soon after the discovery of watches ; which was repeated with increased accuracy, till Mr. Harrison, about forty years ago, received a parliamentary reward of *twenty thousand pounds*, for the invention of a time-piece for that purpose. This, however, being subject to accidents, it was expedient that some less fallible method should be sought after ; and, accordingly, rewards were still held out by Government for the discovery. The new theory of the moon, as founded on the laws of gravitation developed by Sir I. Newton, has furnished another source of determining the longitude. The phænomenon of a lunar eclipse seldom occurring, precludes the general utility of ascertaining the longitude by that means. The most certain and practical method, and that which is attended with the most success *at sea*, is that of *observing the distance of the moon from the sun, or a fixed star*, originally proposed by John Werner, about three centuries ago, but put in practice by the late Astronomer Royal, Dr. Maskelyne. This problem is now solved with considerable accuracy, since the invention of Hadley's quadrant, and the construction of Tables corresponding to the irregular motion of the moon in every part of her orbit : and its great importance to Navigation and Geography, renders the *Lunar Observations* a most invaluable and indispensable acquisition to every mariner.— Whatever tends to the improvement of the naval art, cannot be too highly estimated. For whether we consider the numerous advantages that result from the mutual intercourse between one nation and another, whether of a commercial, political, or scientific nature; or the extension of mere geographical knowledge, or the means of self-defence ; in every point of view, Navigation is an art of the utmost benefit and utility to mankind. And in this island especially, “ this precious gem set in the silver sea,” it constitutes at once the pride, the boast, and the bulwark of Britons.

Another science in which Mathematics and Philosophy go hand in hand, and which, on account of its affinity with Astronomy, and the aid it gives to it, I shall next mention, is Optics, which treats of the element of light, and the various phenomena of vision. And here again Geometry is the handmaid that exhibits to us the laws of refrangibility, of refraction and reflection of light, and the principles on which all optical instruments are constructed. Were there to be derived to mankind from this science no other advantage than that of aiding the decayed sight, when "wisdom at one entrance *would* be quite shut out," it would be entitled to no little estimation; but when it displays to us the theory of light and colours, and the nature of vision; when, from the simple lens, it proceeds to the microscope, and places before our sight innumerable creatures unknown before; and even exhibits ocular demonstration of that invaluable discovery, the circulation of the blood; above all, when by means of the telescope, it brings to our astonished sight worlds and systems of worlds, unknown to the ancients, and displays to us the most sublime and amazing phenomena of the natural world; this delightful science renders the noblest of our senses the portal of wisdom in a tenfold degree.

Nearly allied to this science, if not a branch of it, is the art of *perspective*; which is of indispensable use in Architecture and Fortification, as well as in the Mechanical and fine Arts. The painter especially, whose business is to represent nature and truth, cannot carry his designs into execution without it.

But there is no science that comes under the denomination of mixed Mathematics, of more real and extensive utility than Mechanics. There is hardly any situation in life to which it does not afford numerous advantages. Combining Geometry and the analytic art, as extended by the immortal Newton, with the laws of motion and gravity and the mechanic powers—pure Mathematics with Philosophy—experiment with theory—it investigates the centre of gravity of bodies, the strength and stress of materials, and the equilibrium of arches; ascertains the circumstances of bodies in motion, either rotatory, descending, or projectile, with the properties of fluids; and teaches the construction of machines for all the activi-

purposes of life, and estimates their maximum effects. In agriculture and commerce, the chief if not the only source of the wealth of nations, the use of machinery is equally important and indispensable, and whatever excellence the ancients might have attained in other sciences, it is evident that in the art of constructing Machines and engines for useful purposes, the moderns have arrived at a perfection far beyond any thing which their ancestors could boast of. The discoveries and improvements of machinery in this country, are no less honourable to its artists than beneficial to the community, by promoting at once the interests of the agricultural and commercial world. In proportion as Navigation has extended the channels of commerce abroad, the facilities of the manufacturer and the artizan have been increased at home, by the cultivation of the Mechanical sciences. And thus we see of how great use and advantage the Mathematics are in all those sciences which contribute to the comfort and conveniences of human life; and even in those practical arts which are termed manual, although not conducted by the strict principles and rules of Geometry, he is the most expert mechanic or artizan, who makes the nearest approach to that perfection.*

3. We come, lastly, to speak of the utility or propriety of those branches of Mathematical study, which are termed *speculative*. And here it may be asked, what real advantage, either to individuals or to the community, can be derived from merely speculative science? It is a noble inquiry that leads us to the true system of the world, and is the source of many useful improvements and discoveries in Geography and Navigation; but of what practical consequence is it to us that Saturn has a belt, and Jupiter four revolving moons? The problems

* If in the fine arts, the aid of these sciences is less required, this furnishes little or no argument against their general utility: yet even here they do not withhold their assistance: the painter will acknowledge it; and in regard to the divine art of music, the *genius of mathematics may say, with the God himself, per me concordant carmina seruic.*

of Euclid have most of them some practical application; but to what purpose are those endless speculations about porisms and abstract propositions, of no obvious utility, on which Mathematicians have bestowed such infinite labour? The Conic Sections are of great importance and utility in various departments of the Mathematics and Natural Philosophy; but why are we continually investigating the properties of new curves, of no other apparent possible use than to gratify an idle imagination? Such are the questions of those who have not yet learnt to set a due estimation on Mathematical truth. The Mathematician and the Philosopher have more just, and more enlightened views. The delight itself that arises from the contemplation of truth, the expanding and invigorating of the mind; the connexion which the sciences have with each other; and the incalculable advantages that have already been derived from their combined principles, are all arguments so strong in favour of Mathematical researches, as to render it a matter of doubt whether it is possible to carry our speculations in these sciences too far. If we take a review of the various pursuits and designs to which the minds of men are directed, we shall hardly find them always attended with a real and practical utility; but how often shall we discover that they have not even any object in view that is *rational*? Shall then the discovery and contemplation of a mere abstract truth be condemned as an idle speculation? The pursuit of truth is, at least, a rational and delightful employment of our intellectual faculties; and is, to say the least in its favour, infinitely superior to that misapplication of time and perversion of reason, which are spent and exercised on unworthy objects. Truth is always of intrinsic value. It is the sterling currency of scientific men. Not like the provincial coin of an upstart despot, to serve some private or partial end; it will pass at all times and in every region of the globe where reason and science hold their enlightened court. And here I would guard the youthful mind against the poison of a vain philosophy, that would boldly declare the want of all absolute and eternal truth in the world; because, forsooth, what is one man's *truth*, *may not be the truth or truth of another*; and would

entreat him to consider, that there are things in this world of wonder and astonishment, which are *every man's troth*, and therefore *eternally true*. Such are the being of a God, and the eternity of the soul; and such too are the truths of Mathematics.

But the bare investigation of truth is not only attended with pleasure as a rational amusement, but is likewise productive of a present solid and permanent good. It expands and invigorates the youthful mind, habituates it to rational and sound argument, and excites a genuine thirst for knowledge and truth wherever it may be found. Besides, the mutual relation which subsists among the various branches of Mathematics and Natural Philosophy, and the natural tendency which one truth has to aid or develope another, often leads to discoveries that we are neither prepared to expect, nor able justly to appreciate. Hence it is that the discovery of Jupiter's satellites is to be attributed to the invention of telescopes by Galileo; and from the eclipses of these satellites by their primary, though at first a phænomenon of no apparent utility to us, we afterwards derived a most certain method of ascertaining the longitude of places on our own globe; a discovery of infinite value to the science of Geography. So Geography derives an important advantage from Astronomy, which cannot be too much cultivated on that account; Astronomy is in its turn assisted by Optics, through means of perspective glasses, which therefore cannot be brought to too great nicety and perfection; and these again are constructed on the principles of Geometry, which, as the foundation of this and all the Mathematical sciences, ought to be studied with the utmost diligence and assiduity. These eclipses of Jupiter's moons are further useful in demonstrating to us a very important fact in natural philosophy: that the velocity of light, though not instantaneous, is amazingly great. It is from a combination of various sciences that we derive some of the most useful inventions. The steam-engine is constructed on the principles of Geometry, Mechanics, and Hydrostatics; pumps are the result of a similar combination; and most of those machines that in a thousand ways contribute to the convenience and benefit of mankind. Each science, therefore, should be carried to

its highest pitch. The abstract and dry speculations of Geometry may not, indeed, be useful in themselves, but as they are connected with other truths, or lead to those that are useful. It is enough if the association of many truths produce some practical good. It is in itself an unimportant thing to know, that in a parabola the subtangent is double the corresponding abscissa; yet it is a species of knowledge so necessary, that the art of throwing bombs with any degree of precision could not be attained without it. Thus, the combination of this truth with the laws of gravity, produces a practical use in the science of Gunnery. Again, the principle of the inclined plane depends on the laws of gravity, and the theory of the pendulum on that of the inclined plane, and by the motion of the pendulum is regulated the uniform procession of time and the construction of clocks, so useful in every situation of life. And the doctrine of pendulums in some measure is connected with a curve called the Cycloid, a fact of which the inventors of this curve were entirely ignorant. It is also the curve of quickest descent, and therefore applicable to other useful purposes: but when the greatest geometricans of the 17th century set about the invention of this curve, they only engaged in the speculation out of mere vanity, striving to surpass each other in the discovery of difficult theorems. They did not even pretend that it was for the public good. Thus in Mathematics, as in other sciences, to lay up a stock of truths, whilst it can never prove an individual injury, or a burden to the mind, may ultimately be found of the highest advantage to the community. Amongst a great deal of ore we may discover some precious metal that will reward our industry, and compensate us for the impropriation of our time. At least the sciences constitute the only genuine mine in which we can search for it. Above all, geometrical speculations are undoubtedly the most valuable. It is the science of relations in the general; and, as the universal instrument, it cannot be too far extended. Algebra, for the same reason, is entitled to a similar degree of speculative study: it has even lent aid to Geometry itself: and it is this analytic art that gives such facilities to that noblest of all Mathematical studies, the science of Fluxions, which,

whilst it assists the rest in their greatest wants and difficulties, does, by the aid of Algebra, or Universal Arithmetic, confirm and complete the whole circle of the Mathematics. Admitting most unequivocally that there may be many truths in speculative science that are dry and barren in themselves, we see to what important discoveries they may conduct us. But independent of their possible utility when combined with others, there is a lustre which they mutually give and receive, as it were, by reflection, and by being placed in the same intellectual hemisphere, like stars in the convex heaven. So that truths of the first magnitude seem to owe their superlative splendour to the twinkling of inferior fires; whilst some truths, that are at present the farthest removed from usefulness, may resemble those stars, which, though scarcely discernible by reason of their distance, are of infinitely greater magnitude and splendour than those which blaze so full on our dazzled sight.

Lastly, the truths of mere speculative science are valuable in another light. The mind as well as the body requires refection: we have spiritual as well as corporal necessities: and whatever truths raise us to great and noble reflection, though but speculative in their nature, afford a spiritual and philosophical utility. Hence arises that pleasure, that elation of the mind, on the contemplation of some demonstration in Geometry, or the solution of some difficult problem in Algebra; when it exults it knows not why, and rests gratified only with the success of its own exertions. Is it not that truth is congenial to the soul of man? its element, its food, the very basis and support of its rational existence? Let them, therefore, who deprecate this species of Mathematical studies, rest satisfied in their own intellectual element; and let them who admire and prosecute it, continue to enjoy the delightful feast. They who neglect the Mathematical sciences altogether, must, after all, be informed, that they hardly enjoy one-half the full store of intellectual life and pleasure for which they are designed; whilst he who studies every science, but studies to live again; every science is a new existence, or a new approximation to the

most perfect being. Our intellectual, like the natural world, is not enlightened by one, but by ten thousand rays. Some live in the profound darkness of midnight, on whose minds the Sun of Science never shot one piercing ray: some in the moon's pale and tranquil light, are content to borrow all they know from others: others are still groping in the twilight's gloom; but happy, thrice happy are they, whose minds are enlightened by rays of meridian splendour.

Q.

A REPLY TO AGRICOLA.

(Concluded from our last.)

He also modestly asserts that we are "hated" for our greatness. If this be admitted, I would ask who has made us so: is it the farmer by exporting his grain? No, our farmers are so far from doing this, that they cannot supply their own nation. But our manufacturers have, through their inventions and ingenuity, been enabled to give them almost twice as much for their produce as any foreign manufacturers could afford; and by these means have prevented the national debt from oppressing the land owner, which would have long ago been insupportable.

I think it is now time to bid adieu to Agricola, and his inconsistent piece of patch-work; and we may say of it as the Frenchman said of English punch: it is a liquor of contradictions; for there is the rum to make it strong, water to make it weak, sugar to make it sweet, and lemon to make it sour.

I cannot dismiss this subject without making some further observations, to prove that commerce is the chief prop of our greatness; take this away, and agriculture immediately declines; for land, in all nations, fluctuates in value according to the increase or decrease of its commerce, and its produce will always reach a fair price, without any indirect means to bolster it up. Have the agriculturists enabled the shopkeepers of the metropolis, and other opulent towns, to exhibit such a numerous collection of unparalleled rarities, culled from all parts of the globe? What has enabled the modern farmers to lay aside their rough linsey-woolsey habits, and decorate

their sons in cloth of the finest texture, and their daughters in silks and muslins of the softest touch ; and imitate them not in the old fashioned arts of ploughing, tilling, reaping, making butter and cheese ; but in the present fashionable follies of the day ? Miss must keep her hands white that they may be seen to advantage, when fingering the keys of the piano-forte ; and the young gentleman must not make his rough by labour, lest he should disgust his fair partner at the ball.

Has agriculture enabled Britain to combat the different nations of the continent, for twenty years, and at last to terminate the arduous struggle with honour and victory ? Is it agriculture that gives motion to that one-armed labourer, the steam engine, and its dependent machinery, blessing thousands of families with work and bread ? The manufacturers, by their united aid, have been enabled to undersell their neighbours of the continent, and extend their commerce ; which would have been an impossibility forty years ago, when one man was doomed to watch a solitary spindle.

Is it agriculture that causes the docks of the British sea-ports to be crowded with such immense numbers of vessels, which have traversed the globe in all directions, faced all dangers, and collected sweets and property from all the tribes of the earth ; enriching the national hive by their laudable industry, providing employment and sustenance for millions, and making their hearts glad. Now it is evident that these are the springs on which our greatness depends ; and that *commerce*, and not *agriculture*, is the life of our island ; and that the latter is indebted to the former.

In corroboration of the above opinion, I close my remarks with an extract from a celebrated writer :—

“ The wealth, prosperity, and importance of every thing upon earth, arises from the **TILLER**, the **MANUFACTURER**, and the **MERCHANT** ; and that as nothing is truly estimable, save in proportion to its utility, these are consequently important characters. The Tiller supplies the Manufacturer, the Manufacturer supplies the Merchant, and the Merchant supplies the world with all its

wealth. It is thus that industry is promoted, arts invented and improved, commerce extended, superfluities mutually vended, wants mutually supplied ; that each man becomes a useful member of society ; and that societies become further of advantage to each other.

“ The merchant, above all, is extensive, considerable, and respectable, by his occupation. It is he who furnishes every comfort, convenience, and elegance of life ; who carries off every redundancy, who fills up every want ; who ties country to country, and clime to clime, and brings the remotest regions to neighbourhood and converse ; who makes man to be literally the lord of the creation, and gives him an interest in whatever is done upon earth ; who furnishes to each the product of all lands, and the labours of all nations ; and thus knits into one family, and weaves into one web, the affinity and brotherhood of all mankind.

“ A nation that is a merchant has no need of an extent of lands, as it can derive to itself subsistence from all parts of the globe. Tyre was situated in a small island on the coast of Phoenicia, and yet that single city contained the most flourishing, opulent, and powerful nation in the universe ; a nation that long withstood the united forces of the three first monarchies brought against her by Nebuchadnezzar and Alexander the Great. The Seven United Provinces do not contain land sufficient for the subsistence of one-third of their inhabitants ; but they are a nation of merchants ; the world furnishes them with an abundance of all good things : by commerce, they have arrived at empire ; they have assumed to themselves the principality of the ocean ; and by being lords of the ocean, are in a measure become the proprietors of all lands.

“ Avarice may pile ; robbery may plunder ; new mines may be opened ; hidden treasure may be discovered ; gamesters may win cash ; conquerors may win kingdoms ; but all such means of acquiring riches are transient and determinable : while industry and COMMERCE are the mutual, the living, the never-failing fountain, whence the wealth of this world can alone be taught to flow.

I am, respectfully yours, VIRIDE LIGNUM.

Drake-street, Rochdale, March 20th, 1815.

AGRICOLA TO ——.

It is so common to see party zeal, when it has entered the field of controversy, converted into personal aversion, that I am not at all surprized to find you the deserter and not the brave defender of the cause you have espoused.— You have left my arguments against it unassailed, and endeavoured to render me ridiculous by a forced collocation of unconnected sentences; which you have treated as Procrustes did his prisoners, and paired after such a fashion, as to realize the dreams of Virgil, when he talked of the union of mares and griffins, lambs and lions. I shall now do myself an act of justice; and if the singular exposition of your misrepresentations and absurdities shift the ridicule upon yourself: if you appear in public with a wreath of goose-grass, and the very boys point their fingers as you pass, it cannot be imputed to a sort of unchristian charity in me.

I have said, “if a *death-blow* be given to our agriculture, every village will become a work-house, and every inhabitant a pauper;” and though the context clearly proves the term to be figurative of importation prices, you are pleased to inquire, if I would insinuate that bread sold at a reasonable price will cause a calamity so direful. As well might you ask, if the terms mean and extreme are convertible! I acquit you of ignorance so glaring, and leave the purport of the question to the surmises of the reader.— You affect to be mightily displeased, that I should undervalue our foreign commerce, and, with a wilful eagerness to expose my inconsistency, stumble on the following passage: “*a good government* will ameliorate the condition of the Poles, and if manufactures are introduced, *a middle class* will have the same effect in Russia.” Then, as if forsooth commerce were but another term for government and manufactures, you tell the reader I insinuate, that *commerce* will improve the condition of these unhappy nations; and, glorying in my inconsistency, ask with a naïvete really exquisite, if this does not prove the utility of trade! Now am I to consider this a specimen of your ‘impartiality and candour,’ or do you really

think that good government is commerce ; commerce manufactures ; and manufactures trade ? The next class of your *incuriae* betrays your ignorance of internal trade altogether, and in my opinion fixes the nature of the error.

2ndly. Because I have said in reference to another subject, "that cheapness quickens the efforts of the manufacturer ;" and have elsewhere asserted that "our commerce will ultimately leave us, to flow in other channels," you directly accuse me of a blunder. Now, waving the question as to the fairness of such a collocation of unconnected sentences, stripped of their contexts, and placed cheek by jowl, without a rag of dress to denote their sexual distinctions, the inconsistency you cast upon me is only substantiated by an assumption of your own—that foreign commerce is the main-stay of our manufactures, and that our internal trade is relatively nothing—an assumption I deny, and dare you to the proof.—Dazzled by the splendid vision of our foreign commerce, you again lose sight of home consumption, when you hold me up to scorn, because I said, that in the event of this country being wholly dependent on foreigners for supplies of grain, the taxes that used to be paid by the farmer must be levied on the manufacturer. You admire the blindness that cannot see the impossibility of levying additional taxes on the manufacturer, when his commerce is flowing in other channels ! Let me tell you, Sir, this internal trade, of whose existence you seem to be as unconscious as an infant, yields a revenue to the nation of 240 millions annually ; whereas, the income arising from our boasted foreign commerce is not 45.

3rdly. I now come to errors of another cast indeed, but to the full as egregious as their brethren that have gone before them. I have said that during the operation of the Berlin and Milan decrees, when every avenue to foreign trade was closed, the revenue of the country was never greater. This you deny, because sooth there was a defalcation in the excise ! As well might you close your eyes upon the tables which indicate the unexampled prosperity of the nation at that period ; and because a few towns were thinned of their inhabitants, and their merchants declared bankrupts, affirm that the wealth of the nation had declined, and that her population had retrograded.

—Of the same species with this, is your opinion about the sale of wool. My position is, that the manufacturer, blessed with a monopoly, pays the farmer for his wool just what price he pleases. “The reverse of this is the fact,” say you, “because the farmer will have his own price for his wool;” as though the limitation of the market to this island did not moderate the demands of the farmer, and restrict his price to the wishes of the manufacturer! The next mistake is very curious. I have said, “so long as those causes operate which have doubled and trebled the cost of every thing, so long *ought* rents and tithes to maintain their present altitude. It is true they *must* be ultimately lowered; necessity will cause their abatement: but this necessity is the ruin of the present race of farmers.” Of this you make an imperfect transcript, and supposing (*risum teneatis amici*) that *ought* and *must* are synonymous, charge me with inconsistency!

A word or two and I have done. You are pleased to be merry with the fractional statement of our commerce by the Quarterly Reviewers, but have prudently forborne its refutation. Now I dare you to disprove it.—On the subject of high prices I may break a lance with you hereafter, if you do not leave the field; a step I would by no means have you take, for I find “there’s entertainment in you.” On this question, in the mean time, the opinion of so competent a judge as Arthur Young is worth your notice. Speaking of Bourdeaux in 1787, he says, “The rent of houses and lodgings rises every day; they complain that the expences of living have increased in ten years 30 per cent. There can hardly be a clearer proof of an advance of prosperity.”* Lastly, let me assure you I am a disinterested advocate, and no enemy to the merchants and manufacturers. I drew the sword in the cause of their brethren the farmers, because I saw them on the verge of ruin, and I knew that the torrent that should sap the foundation, on which stands proudly the superstructure of our manufactures, would overtop them both, and sweep away the frizes, colonades, and decorations, with which commerce has adorned the building.

Beverley, July 15th, 1815.

AGRICOLA.

* Young’s Travels in France, p. 61.

OF THE ANTIQUITY, EXCELLENCE, and USE of DIVINE
MUSIC, in PRIVATE or PUBLIC WORSHIP.

MUSIC, (as I said before,) is the special gift of God:— Firstly, ordained for his divine worship; and secondly, for the delight and solace of mankind, which, as it is agreeable to nature, so it is allowed by God as a temporal blessing to recreate and cheer men, after long studies and tedious labours: it, in an extraordinary manner, stirs up the spirits in divine worship and the service of God; and therefore it has been held in great estimation by the best of men. The ancient philosophers reputed it to be an invention of the Gods, who bestowed it on men, to make them better conditioned than they naturally were; its sweet harmonious sounds do, by their efficacy and delight, move the affections to virtue, gently vent the mourner's grief, and heighten the joy of those that are cheerful. If God then hath granted us such benefits by the civil use thereof, doubtless the divine, and spiritual, will much more redound to our internal comfort here, and eternal joy hereafter.

Music, (says Mr. Tansur,) is a divine and mysterious art, or science, and ought to have the superiority of all other liberal arts and sciences whatsoever; by reason it is employed in the most noble and highest office that can be performed by either men or angels; which soundeth forth the praise and glory of the author of all created harmony. It would be needless (says he,) for me to mention many authors to prove the antiquity of divine music, by reason it was not only held in the greatest reverence and honour, by the most noble and virtuous persons in all ages, but it was also acceptable unto God in his holy worship, as appears in 2d Chron. chap. v. ver. 12, 13. It also appears that music was used in all ages in the worship and service of God in churches, from the true evidence of God's word in the holy scriptures; and that the same should also be continued both vocal and instrumental. Holy David was not only one in whom the holy spirit of God dwelt, but was also a man after God's own heart: who was seldom met without a psalm in his mouth, or an instrument in his hand; whose music had such sweet, sacred, and charming

power in it, that it drove the evil spirit from Saul; (1st Samuel, chap. xviii. v. 10.) And Elisha also brought the holy spirit upon himself; (2d Kings, chap. iii. v. 15.) Which examples plainly demonstrate that no evil spirit will abide where music and harmony are used: then certainly, when it is formed into a sweet and regular composition, it renders it the more fit for the holy spirit to work upon, and also to convey truth to the understanding; hence it is, that all who practice divine music, must allow it to be the gift of God, as a true representation of the sweet concert and harmony which his infinite wisdom hath made in the creation and administration of the world, and given to us as a temporary blessing; both for his service, and also for our own delight and recreation. (Eccl. chap. xl. v. 20.)

Since this noble and delightful art can enable us to sing our maker's praise, how much ought we to endeavour to attain the true knowledge of it—it being a most curious and sublime art, either in its theoretic, mathematic, or practical part, or in its active or mechanic part. The theoretic or mathematical part, is that which demonstrates the grammar or groundwork of music, which employs the affections on all the ratios or proportions of sound, in all their curious branches: this part lies very deep, and requires great research into natural philosophy to unfold it, before such sounds can be disposed of to complete harmony. The practical part is that which designs, contrives, and composes all sounds into so many curious and stupendous varieties, which proceed only from the consequence of three concords, and some intervening discords, in a regular composition; when this part is added to the former, they, together, make harmony complete. The active or mechanic part, is that which performs and brings forth all sounds, both to the ear and understanding; either from the sweet modulations of a natural voice, or by the curious dexterity of hand on some artificial instrument—which makes impressions upon our minds and spirits, and lifts up our hearts to heavenly things.

It is no small wonder to me to hear many persons of good sense express a great dislike to music, when, at the same time, they acknowledge that it has the most improving influences over their minds. this seems a very unhappy

contradiction, that persons should not have a veneration for that art which raises in them the greatest varieties of sublime pleasures, especially to that kind of music which redounds to our maker's praise, and to our eternal comfort, both in this world, and also in that which is to come. I cannot omit speaking in the praise of that most heavenly and laudable custom performed on the organ, just before the first lesson, (which piece of harmony is commonly called a voluntary,) by which we are supposed to be prepared for the admission of those divine truths we are afterwards going to receive; which drives from our hearts all worldly regards, and impure thoughts, which would hinder us in our devotion—it diffuses a calmness all around us—it delights our eyes, and recreates our minds—it fills our souls with pure and useful thoughts, so that nothing is near our souls but peace and tranquillity; and when the music sounds the sweetest in our ears, then, certainly, truth follows the clearest into our minds. Oh! how do the blessed spirits rejoice to behold man prostrating his soul in this pathetic method; pouring out his soul in such a warmth of piety! How can the most hardened sinner but have veneration, and be softened, when he hears the praises of our great Creator described in the most expressive harmony? when it was his great and infinite goodness to bestow and frame for us the nature of harmony only for the very same divine and holy use; and we are in duty bound to praise him with it in our public and private devotions.—But alas! in this our age, the right use of music is not only frequently profaned, but also condemned by many ignorant and blind zealots, who do not, or will not endeavour to know the excellence thereof: the reason of which is, (as I conceive) they have no taste or relish of true godliness—they are enemies to all piety and learning, and their lives are inharmonical—they envy all that are not worse than themselves, and hate to see others perform what they cannot attain.—But though they cast so much contempt and scorn on such as perform this part of divine worship in this world, I doubt not but they would gladly be partakers of that sweet concert and harmony which is incessantly performed in the world above;—this, alas! unwise men do not consider, neither do fools understand it; destruction and unhappiness are

in their ways—the way of peace they have not known, neither is the fear of God before their eyes:—He that dwelleth in the heavens shall laugh them to scorn, and shall bruise them in pieces like a potter's vessel: but as for me I will praise the Lord, because it is comfortable; and will sing praises unto his name, because it is lovely.

The praising of God by psalms and hymns (says Mr. Playford,) is, it seems, a part of natural religion, owned and used by all mankind; so we find the practice of it very early in the Church of God. There can, says he, be no just cause to doubt, but that it was at least contemporary with instrumental music, a thing as ancient as the time of Adam, invented by Jubal, the father of all such as handled the harp and the organ. But we need not build upon conjectures, where we have clear evidence: After the famous deliverance which God gave the Israelites at the Red Sea, they celebrated the mercy with a song of triumph; and Josephus says, they spent the whole night in hymns and mirth: Then sang Moses and the Children of Israel, this song unto the Lord (Exod. chap. xv. v. 1.) which is there upon record, composed (as Josephus adds) in hexameter verse: and that it was conjoined with instrumental music, is plain from v. 20, 21.: And Miriam the prophetess, the sister of Aaron, took a timbrel in her hand, and all the women went out after her with timbrels and with dances; and Miriam answered them, sing ye to the Lord, for he hath triumphed gloriously, &c. &c. But the first who established the singing of psalms and hymns, as a fixed and constant part of God's public worship in the solemn assemblies of the Jewish church, was King David; whose zeal for God's glory (before the house of God was built) set himself to compose divers psalms for that service, as we read in 1st Chron. chap. xvi. v. 7. and chap. xxv. v. 6, 7. and to choose out men skilful in song, to perform the same in the praise of Almighty God. When his son Solomon had finished the temple, at the dedication thereof, you read how the praises of the Lord were sounded forth with voices and instruments, and also how acceptable it was to the Lord. This being established, the Priests and Levites continued this solemn worship during the time of the first and second temple, even until the destruction thereof, foretold by our blessed Saviour, who saw the glory

thereof, and frequented the place; as he acknowledgeth, Luke, chap. xxii. v. 53. I was daily with you in the temple: and, (as a learned divine observes,) it is not credible that our blessed Saviour, who so often quoted David's psalms for the confirmation of his doctrine, would neglect that part of worship then in force, and who did himself say, that it became him to fulfil all righteousness;—which he further testified, when together with his disciples, he sung a psalm or hymn at the end of the celebration of his last supper. After his ascension, his disciples gave testimony of their approbation; Acts, chap. ii. v. 46, 47. They were daily with one accord in the temple praising God, &c.: and Acts, chap. iii. v. 1. mentions, that Peter and John went up together into the temple at the hour of prayer, which was the set time for the celebration of public worship.

(To be continued.)

MR. EDITOR,

THIS thought has struck me—that it is a misfortune to the world, when an individual has obtained so much repute for knowledge and learning, that no person cares to interfere with his notions or opinions, lest he should draw on himself such a reply as would not only give rise to uncomfortable feelings, but probably make him look ridiculous. Whether this is the correct way of accounting for the unnoticed absurdities of great men, or whether it is the reason why all your readers have remained silent respecting an Essay on Happiness, which appeared in No. VI. of the Q. V. I know not; but, whatever may have been the cause of this silence, it is, I think, the more to be regretted, as that Essay, not only in my, but I dare say in the view of many of your readers, contains much objectionable matter—matter, the tendency of which is to undo *all* that the individual and united wisdom of ages,—that the providence of God *too* has done for us since the flood.

If, Sir, we can bring ourselves to believe that the Indians, pointed out in Mr. F.'s production, are really happier than Europeans, we may, in that case, bid farewell to every thing which has a tendency to raise us above mere sensual enjoyment.—Farewell then, as useless, to art and science, and to every source, the abundance and excellency of

which, now, yields us, even around our firesides, so much pleasure, if not happiness—farewell also to your agreeable work the *Visitor* :—not only would darkness, but the grossest darkness soon cover us as a people.

Losses, crosses, cares and wants, seem so much, and no doubt but for wise ends, interwoven with our very natures, that not *a few* are ready to declare, that if happiness be spoken of as a something continued, or in constant *possession*, they do not believe that there is such a state. It will however be some satisfaction to the minds of such persons to learn, that Mr. F. has found out a people, though unfortunately, for example's sake, at a distance, who, to use his own words, are truly happy ; as he wishes to prove, by “the sparkling of their eyes and their smiling countenances.”—Hence there is no need to despair. As an individual, I feel indebted to our author for this information ; and my obligation will be much increased, if he will inform me where the work, for I presume it is one, is to be met with, from which he has taken his account of this once happy race of people :—My reason for this request is, that the brevity of his statement precludes many particulars, with which I am desirous of being acquainted : for instance, as those Indians live by hunting (“a bow and an arrow being nearly all the requisites for obtaining all the necessaries of life”), which every body knows is a most uncertain employment, I should be glad to know how often they returned home without being successful ; and if at such times they and their families were happy in going to bed supperless. Hunger is a keen thing—only a slight feeling of it, in this country, causes dissatisfaction ; and as human nature is much the same all over the world, I fancy those Indians, under similar circumstances, would not be exactly comfortable. Again, I should be glad to know, if those Indians had amongst them their chiefs or head men ? persons living apparently without labour ; and if so, whether they were perfectly satisfied in having such to support ? I have seldom met with an individual in low life who did not prove himself a dissatisfied discontented being : ever ready to repine at the ways of providence, and always to try to level to his

own, the characters of those whom fortune had placed above him. With high life, I am not much acquainted, but have been told, that even here, if the mind is uninformed, either pride, vanity, envy, or ambition makes its appearance: qualities, it must be admitted, by no means friendly to happiness.

Again, have those Indians any idea of God, or whether, like most poor creatures of this sort, do they remain so ignorant as to believe that stocks, stones, dogs, cats, leeks, and onions, are fit objects of worship? And lastly, I must ask, most distinctly, whether, when their parents have grown old and infirm, they leave them to perish by famine, by beasts of prey, or in any such shocking manner. If so, what European would have failed to envy their happiness?

Mr. F. will, I trust, excuse me for being so particular; but I really must have some slight knowledge of this sort before I can think as he does; or even that those Indians, in any proper sense of the word, are so happy as the most illiterate in this country. For this reason, amongst many other, they are destitute of those necessaries which an European can procure.

When any man undertakes the office of judge, his first efforts certainly ought to be to divest himself of every appearance of partiality or prejudice. That our author has not made any effort of this sort is, I am sorry to say, too evident; for, as it were, with a single dash of the pen—the miser, the sportsman, the hero, the haughty emperor, the benevolent man, (a most useful, excellent, and enviable—nay, happy character), the sage, and the fop, are all blotted out in a moment; and to make way for whom?—the lovely offspring of our author's imagination; and whom do you think this lovely personage is? Why an Indian, alias ignorance—a man, who, there is every reason to infer, can neither read nor write. Having introduced this person to you, only be a little patient and you shall hear what kind of happiness it is that this creature enjoys. He, says our author, so far from overstretching his intellectual powers, allows his ideas to remain within their narrow limits; he troubles not himself with a multitude of imaginary wants; but concentrates the whole of his wishes into what is essential to the support of his body. Such, Sir, is the happiness, and the sort of happy-

ness, which a person, living in the *nineteenth century*, has not merely contrasted with what Europeans enjoy, but which, in his opinion, I am, he says, inclined to believe the Indian is superior to it. To differ from clever men is painful; but I trust Mr. F. will forgive me when I say, that *instinct* instead of *intellect*, would have been every way sufficient for the purpose of those Indians—nay, it would have been more advantageous for them: their noses, like that of their dogs, might have assisted them in finding their food. Reason, as they lived, seemed to be of little or no use; and I have no hesitation in saying farther, that the happiness those people were blessed with, is somewhat similar, though by no means so great, as that which hogs, put up in this country to feed, enjoy. Those creatures are constantly crammed with what is not only essential to the support of the body, but to its increase likewise—such enjoyments, I apprehend, hunting would seldom furnish.

If I did not know that human nature was frail, and that the wisest and best of men, not only think, but sometimes act, unlike themselves, I should be ready to express astonishment to find a man of Mr. F.'s information talking as he does—advocating ignorance against knowledge—an opinion so contrary to what most Europeans held, that courage, in such a case, looks not unlike presumption. To prove that our author is opposing the stream, I need only point to our numerous institutions, the sole object of which is not to foster pride, but to improve—to increase the happiness of our fellow-creatures. I remember hearing a poor man say, he considered it an unspeakable happiness, that he had in his youth got so much learning as enabled him to spell our road guide-posts.—How useful would such a thing have been to Mr. F.'s Indians:—those who live by hunting might save much time by knowing the nearest road to their game.

As I differ widely from Mr. F. in the views I have of the subject, on which he has favoured us with his thoughts; so in all probability others will differ again from me. If they should, it would afford me great pleasure to hear what they have to say; because truth, rather than opposition, is my object; and to come at this, on a subject so interesting, is of some importance.

I have my doubts whether the state of which I am about to speak deserves the name of a happy one ; but if any of your readers think it does, I will not dispute the matter with him. Happiness then supposes the absence of these three things : care, pain, and want. If any feeling of this sort, even in the slightest degree, be present, who is there that can say he is happy—none ; but as there are moments and even hours in which we are free from such feeling, at such time we may be pronounced happy. In this state we may be said to be when half asleep, or wholly so.—When we speak of idiots or brutes being happy, this is precisely the sort which presents itself to my view—it is so passive—so destitute of feeling, that I think we ought not to include it—that is, to call it happiness.

The next sort of enjoyment, or happiness, I would mention, is that which the miser feels, when hugging, or counting his golden store ; is that which the fop feels when he fancies himself the object of universal admiration ; or that which the weak fair one is in possession of, at finding herself the toast of a whole county ; or which the sportsman feels when his game drops, and dead, dead, is the cry.

Here I might go on enumerating, for we all have what may be called our hobbies ; and each, from the King to the beggar, feels more or less happiness in the enjoyment of them. The misfortune is, highly gratified as we may be, our feelings are not permanent. The spring whence our pleasures, on such occasions, flow, is generally but from one source, and if we attempt to stick to that source, pleasure becomes fatigue, or else takes wing and flies away. To illustrate this I need only ask, what man, even the miser, would be happy, should he be compelled to be always counting his money, or who would be happy in having hunting and shooting (delightful as these sports are) to follow day by day—wet and dry, as a trade ; or what man, even would be happy, though he loved his wife as himself, in being always tied to her elbow ? The happiness of which I am now speaking is within the reach of almost every body. It is a sort which the ignorant, the uninformed, may enjoy, and if I mistake not, this is the sort which Mr. F.'s Indians are in possession of ; and I believe it is the utmost of what they can enjoy, so long as their minds remain within their narrow limits.

Having spoken of two sorts of happiness common to all, we come now to the third kind, or to that which places the European in a light to which the uninformed Indian is a total stranger; because this happiness is intellectual, it springs from an enlightened mind. Here I must regret my inability to do the subject any thing like justice. Knowledge is the key which unlocks this golden store-house. A person possessing this key, has no need to go from home either to balls, dances, fairs, markets, or to public-houses, in an evening, in search of what, at such places, disappoints its thousands. No; the world, his own mind, his works of literature, present such a one, with numberless subjects and objects, every way worthy of his attention. The use of his reason, and the assistance he derives from the labours of others, make him a philosopher; and the searching of his bible, makes him a christian. He expects no more from the world than he knows the world can give. If prosperity be his portion, his heart expands in acts of charity, kindness, and benevolence; and in all probability he thinks that he cannot better employ his time, his property, and talents, than in attempting to ameliorate the condition of those very men whom it has been Mr. F.'s misfortune to consider so much happier than himself. Here I must remark, that benevolence is one of those acts of feeling which never recurs without bringing a pleasing satisfaction along with it.

If, on the other hand, misfortunes, or rather cross-providences, are the lot of the man, whose mind has been enlightened, he bears them with fortitude, and, like a christian of old, is led to exclaim, "troubled on every side, yet not distressed; perplexed, but not in despair; persecuted, but not forsaken; cast down, but not destroyed." Such a person considers that there is no state so bad, but it might have been worse; and thus feeling begets contentment, a requisite to, if not the whole of happiness.

I feel indebted to Mr. F. for many of the subjects, slightly mentioned in his essay. I mean such as muscular motion, chemical affinity, the motion of the heavenly bodies, electricity, &c.; and as these are all interesting,

and a source of happiness to which the Indians are complete strangers; I will, in speaking farther on the subject, keep as close to them as I can.

Knowledge then, or the right use of reason, teaches man, as it respects his mortal part, that he is a piece of machinery, "fearfully and wonderfully made;" and that if this workmanship be overturned, or used too roughly, some part must give way, and the consequence must be pain or disease. But what do the Indians know of all this? or, alas! what do too many Europeans care about it? Both, if they can, will eat and drink to excess, and appear never so well satisfied as when intoxicated, abasing their natures, and wasting the blessings which kind providence had bestowed on them. Again, a man, whose mind is removed but a small degree above ignorance, has some idea how summer and winter, day and night, come to pass; and probably has also some notion that the doctrine of attraction and projectile motion, are not philosophically sufficient of themselves, to account for the annual and diurnal motion of our earth, and the other planets round the sun; and likewise, that dead matter does not attract dead matter by any *innate property*.—But what, I may again ask, do the Indians know on such subjects? In all probability they worship the sun, as the first cause. Again, is the knowledge of chemistry no sort of happiness, or profit to a man? Is it no pleasure to know, that by the mixture of this or that article, a compound may be produced, which a person, who is a stranger to things of this nature, is puzzled to find out? I only wish the Indians understood this art; soap to wash their greasy king would be a luxury to which they are at present strangers. Again, is it no pleasure to be able, (whilst other people are trembling and quaking by electricity,) to account for thunder and lightning, without entertaining the vulgar notion, when it thunders, that God is angry?

Are not our means increased—are we not much happier by being able to read and to write, to transact business, to order and import those articles necessary to our comfort, or to keep alive the flame of friendship or love, by corresponding with those we esteem or regard, who may happen to be at a distance?—As also from a knowledge of music, drawing, painting, &c.—and above all, with

having it in our power to converse (not merely to gabble) with each other, especially with sensible well-informed females? Who is there, I wonder, who has once tasted of pleasure—of happiness of this sort, that would resign it for all the *merry to-morrow head-ache-rows*, he ever experienced? In short, what a pleasure it is to be able to think for ourselves, on any subject, without being under the necessity of pinning one's faith, or conduct, on any man's sleeve, or on any man's opinion. I say, can ignorance do this?—No: it believes or disbelieves, just as partiality or prejudice may be the stronger, all that is said; it has no means of detecting falsehood.

(*To be continued.*)

TRANSLATION.

To the Editor of the QUARTERLY VISITOR.

SIR.—The following is a translation of the Latin Epitaph inserted in the last number of the Quarterly Visitor. If you think it worthy of insertion in your next number, you will oblige your new friend, INEXPERTUS.

June 6th, 1815.

TO THE MEMORY OF
DIANA, Countess of OXFORD and ELGIN,
 Who,
 Sprung from illustrious blood, rendered that blood still
 more illustrious,
 Ennobled by the merits of the CECILS, but more so by her
 own.

She was one who knew not how to be inferior to the
 greatest:

Innocence adorned her early life;
 A full choir of virtues her maturer age,
 which terminated in a happy death.

She was married twice;

And, as neither virtue nor happiness ever forsook her,
 she was equally beloved by both her husbands.

She tenderly cherished the first;
 But such was the piety and love with which she treated
 the second,
 That he who, in his lifetime, respected her as a parent,

At his death bequeathed her his patrimony as a son.
Her tenderness, as a stepmother, surpassed that of a mother.

Such was the mildness and prudence with which she governed her domestics,
That she seemed to preside more like the soul in the body than a mistress over a family.

Finally, with a mind full of chastity, resignation, fortitude, and piety,

Having given a most perfect example to all virgins, widows, and wives,

Her soul superior to earth, fled to its equals above.

Mr. B. CROFT GOODISON also favoured us with a masterly translation, which should have been inserted, but for want of room.

To the Editor of the QUARTERLY VISITOR.

SIR,—Having observed some Latin for Translation in your last number, I thought that another inscription, for the same purpose, might be received.

I am, Sir, yours, &c.

S.

HULL, June 9th, 1815.

An INSCRIPTION to the memory of Dr. T. SMOLLET, inscribed on a Pillar erected on the banks of the *Leven*, near *GLASGOW*.

Siste Viator!

Si lepores ingeniique venam benignam,

Si morum callidissimum pictorem

Unquam es miratas

Immorare paululum memorie

TOBIAS SMOLLET, M. D.

Viri virtutibus hisce

Quas in homine & cive,

Et laudes & imiteris,

Haud mediocriter ornati:

Qui in literis varii versatus,

Postquam felicitate sibi propria

Sese posteris commendaverat,

Morte acerba raptus,

Anno aetatis 51.

Eheu ! quam procula pætria !
 Prope Liburni, protum in Italia,
 Jacet sepultus,
 Tali tantoque viro, patrueli suo,
 Cui in decursu lampada
 Se potius tradidisse decuit :
 Hanc columnam,
 Amoris, eheu ! inane monumentum
 In ipsi Leviniae ripis,
 Quas versiculis sub exitu vitæ illustratæ
 Primis infans vagitibus personuit
 Ponendam curavit
JACOBUS SMOLLET de BONHILL,
 Abi & reminiscere,
 Hoc quidem honore,
 Non modo defuncti memoriæ,
 Verum etiam exemplo, prospectum esse ;
 Aliis enim, si modo digni sint,
 Idem erit virtutis præmium !

Poetry.

To the Editor of the QUARTERLY VISITOR.

SIR.—The author of the following lines has the merit of being a self-educated Poet, being employed in a branch of calico-printing business, which, though ingenious in itself, is no way congenial to literary pursuits.—The following poetic trifle seems to have been written as a contrast to *Burns*, in his poem, entitled “*Man was made to mourn* ;” and the sentiments, though not learned nor classical, are in general pleasing, as tending to inspire a submissive cheerfulness and resignation.

G.

MAN NE'ER WAS MADE TO MOURN.

The sinking sun, aslaunt the hill,
 Bade labour quit the pleugh ;
 And now in monie a window keek'd,
 To bid mankind adieu :

When musingly I sought the wood,
 Where joyous youth was spent ;
 There, 'neath a shade, a carl was stood,
 Whase body time had bent.

His locks were silver'd o'er wi' years,
 His cloathing coarse and bare ;
 But cheerfu' seem'd his honest heart,
 That had known meikle care :
 Life's spark, tho' drawing near its end,
 Yet cheerfully did burn ;
 In him I read an aged friend
 Wha had forgot to mourn.

"Stranger," quoth he, "where wander'st thou
 Amid the dews of eve ?
 Thine eye, methinks, is wet wi' woe—
 Why shun the world to grieve ?
 O hear a wight, whom age has taugh't,
 Nor mock his years wi' scorn ;
 Be not in youth by sorrow caught—
 Man ne'er was made to mourn.

For me, I'm poor as poor can be,
 Wha 'ance cou'd boast o' wealth ;
 And wan and wither'd is this cheek,
 Where late sat blooming health :
 On earth I am but fortune's sport,
 And wander here forlorn ;
 What then,—life's journey is but short,—
 And why should mortals mourn ?

'Tis hard to lose a partner dear,
 Or parent fond and kind ;
 'Tis hard to lose a friend sincere
 Of independent mind :
 Tho' sweet's the tear by pity shed
 O'er gentle virtue's urn,
 Yet be not sorrow's captive led—
 Man ne'er was made to mourn.

Hast thou been robb'd of a' thy kin,
 That thus thou heav'st a sigh ?
 Or griev'st thou for some faithful frien'
 On whom thou could'st rely ?
 A friendless brother here behold,
 Death a' traed me has torn ;
 Yet something bids me aye be bold—
 Man ne'er was made to mourn.

Hast thou by hope been aft beguiled,
 Or sail'd down pleasure's stream ?
 And started back at ruin's brink,
 Like ane wak'd frae a dream ;
 Tho' monie cares on pleasure wait,
 Egae which 'tis wise to turn,
 Repentance never is too late,
 Then why should mortals mourn ?

Or envy'st thou yon pamper'd lord,
 Wha rules at pleasure's ball ?
 Let plenty meet him at his board,
 And numbers wait his call ;
 That wealth is gien him but in trust,
 Tho' he at poortith spurn ;
 The man wha poor, dares to be just,
 Hath little cause to mourn.

The Pow'r wha rules yon rising orb,
 And sits aboon the sky,
 Has gien to man an angel form,
 But wills that he should die :
 Then what avails a' earthly bliss,
 Since we to dust return ;
 A better world there is than this,
 And why should mortals mourn ?

A' nature view ;—the herds that graze
 Alang the meads rejoice ;
 The sangsters chaunt their gratefu' lays
 Wi' ane accordant voice :
 To lordly man is reason giv'n,
 Yet oft the poor, forlorn,
 By madd'ning passion wildly driv'n,
 Hopeless, live but to mourn.

Howe'er on life's rough sea thou'rt cross'd,
 'Tis madness to despair ;
 The feeblest bark, when tempest-toss'd,
 Some kind relief may share :
 Still cherish *Hope*, that peacefu' guest,
 Nor from *Religion* turn ;
 Then will no tumult swell thy breast,
 Nor thou have cause to mourn."

Here ceas'd the sage, then sought his way
 Along the dark'ning vale ;
 Whose gently, meek, instructive voice
 Came passing on each gale.

Let man ne'er from such rules depart,
 Nor his wise maxims scorn ;
 For know, in spite of learned art,—
 Man ne'er was made to mourn.

Carlisle.

R. ANDERSON.

PIOUS THOUGHTS,
 WRITTEN UNDER THE PRESSURE OF SEVERE ILLNESS.

GREAT GOD, with wonder and with love
 Thy goodness I survey ;
 New are thy favours ev'ry night,
 Repeated ev'ry day.

Thro' the wide range of nature's field
 Thou hear'st the various cries ;
 And thy all-gracious providence
 The various wants supplies.

Beings that wing the fluid air ;
 That range the briny deep :
 That climb the hills, or scour the plain,
 Or in the valley creep :

These on thy sov'reign bounty feed :
 Upon thy care depend :
 To all that lives, and moves, and breathes,
 Thou art the faithful friend.

In the past troubles of my life,
 How clear thy goodness shines ;
 Yet, when affliction's storms arise,
 How dark thy wise designs !

Tho' fell disease invades my frame,
 'Twill work some gracious end :
 In life prolong'd or death conceal'd,
 I cannot comprehend.

But, Lord, I supplicate thy peace
 Beyond this scene of woes,
 If forth thy fatal mandate's gone,
 And my career must close.

But if thy renovating pow'r
 My health again restore,
 Grant that I lead a virtuous life,
 And love thee more and more.

Then, to the mansions of the tomb,
 Whene'er I tread the road,
 Fearless I pass the gloomy vale,
 Supported by my God !

St. Andrewgate, York, Nov. 1814.

T. SMITH.

MR. EDITOR.—Permit me to add the following remark to my answer to Query the 54th. B. FARROW.

ALL moveable matter is under the observation of man: he can move earth, water, and even air itself. Earth, water, and air, can be measured and weighed, but natural light can neither be measured nor weighed; for natural light cannot be controlled by man. Natural light is not consumed like a candle:—but the subject is too sublime for human comprehension.

Answers to Queries.

(62) *Answered by Mr. BAINES, Jun. London.*

PROBABLY the word Tyburn is derived from " Tie" and "burn," which signifies that formerly criminals were tied to a stake and burned at the place which is now called Tyburn. This conjecture will appear reasonable, if it be considered that human victims, in the earliest part of our history, were frequently burned alive for religious purposes, by the Druidical Priests.

(63) *Answered by Mr. WATERLAND, Thedby.*

THE change of the wind, either before or during a thunder-storm, seems to be a natural consequence, resulting from the causes which produce it. Thunder-storms are produced by the meeting of two winds, or streams of air, blowing from opposite quarters. We will suppose, for example, that the wind blows from the East; and that from some cause, a West wind arises; but as the causes

producing the East wind are not removed, it opposes the West wind with its whole force. At the place of meeting, there is naturally a most vehement pressure of the atmosphere, and friction fits parts against one another; a calm ensues; and the vapours, brought by both winds, begin to collect from dark clouds, which can have little motion either way, because they are pressed almost equally on all sides. The West wind, however, which took place last, generally prevails; and what little motion the clouds have is towards the East; whence the common remark in this country, that "thunder-clouds move against the wind." When two streams of air are thus driven against each other, the space where they meet must become highly electrified, in consequence of the pressure above mentioned. The vapours, which are the conducting substances in the atmosphere, become immediately electrified, and all the phenomena of lightning and thunder take place; and a change in the direction of the wind is felt in those places over which the thunder-clouds pass, by the West wind prevailing as above mentioned.—See British Encyclopedia, art. *Thunder*.

The same by Mr. PAGE.

AIR is a fluid, whose resistibility is so weak, that it is put into motion by the action of various things, let their power be ever so small.

It is evident that the attraction of the moon causes the wind to change its direction,* in the same way it causes the tides to ebb and flow. But heat is the principal cause that puts the air into motion. Suppose the whole mass of air which surrounds the globe was at perfect rest, it is easy to demonstrate, that the action of heat alone would soon destroy that rest, and cause the air to flow. For it is well known, that heat rarefies air, and the rarefaction of the air in different parts will be in proportion to the quantity of heat it receives. Hence we may be satisfied, that the air will be more rarefied near the equator, than in the polar regions: consequently, the air in the polar regions will naturally flow towards the equator, and cause a wind.

* This only happens when the air is nearly in equilibrium.

When some parts of the atmosphere are impregnated with common fire, and other parts with electrical fire, and when the heat of the sun has rarefied the air in any particular part, all the surrounding air, which is not thus rarefied, flows towards this part, as the common centre of attraction, and gathers into one focus, clouds, some impregnated with common fire and others with electrical fire, which, when infringing and coalescing, cause the inflammable particles of fire, and thus produce thunder and lightning.

Now it evidently follows that this part, whose air was the most rarefied, becomes (by the collection of clouds, &c. above-mentioned) colder, and more dense, than all the surrounding regions; therefore, the wind must instantly change, and often blow in a contrary direction.

(64) *Answered by Mr. BAINES, Jun. London.*

THE tingling of the fingers is occasioned by an impediment in the circulation of the blood; but when they are plunged into cold water, the blood is immediately forced towards that part of the body which is out of the water; and returning with increased velocity, it shortly removes all impediments in the circulation; and when this is accomplished, the tingling of the fingers ceases.

Answered also by *Mr. Osmond*, the proposer.

(65) *Answered by Mr. BAINES.*

WATER is converted into vapour, and raised into the atmosphere by means of heat; the solar rays also effect this, but the operation is carried on so slowly, that it is seldom visible. However, if the weather be extremely hot, particles of matter are seen dancing and floating in the atmosphere, near the earth; which, as they ascend, become invisible. These particles are the moisture of the earth converted into vapour, and occasion, by endeavouring to ascend, an undulatory motion in the air.

The same by Mr. ENGLAND.

VAPOUR has been explained by the greatest Philosophers, as a compound of water and fire; and water being heavier than air, it must, when left to itself, descend in it; but

when each particle of vapour is so compounded of water and a small portion of fire, as to form a hollow sphere, it ascends on the same principles as an air-balloon, till it reaches another region of the atmosphere as light as itself; and, by its increased magnitude, may, perhaps, be rendered visible.

The same by Mr. WATERLAND.

IN hot weather the air abounds with caloric, which, by reason of its abundance, becomes visible; and being carried along by the wind, causes that tremulous undulatory motion mentioned in the query. The same phenomenon may be exhibited in miniature, at any season of the year, by heating a bar of iron red hot at one end, and then holding it up in the air, the caloric will be seen flying off with a tremulous motion: the same may be observed of a lime-kiln, when in the act of burning.

Also by Messrs. Killingbeck, Osmond, and Watson.

Grammatical and Philosophical Queries.

(68) *By Mr. AMBLER, Eaton Bishop.*

WHICH of our ideas is clearer, that of spirit, or that of substance?

(69) *By Mr. BAINES, Jun. London.*

WHAT is the cause of that stupefaction which persons feel when they begin to smoke tobacco?

(70) *By JUVENIS, Manchester.*

WOULD it not be more agreeable to the present mode of spelling, as well as etymology, if the words *neighbour*, *valour*, *rigour*, &c. were spelt with *or* final, as *terror*, *traitor*, &c. ; which, according to ancient orthography, were written *terrour*, &c.?

(71) *By Mr. OSMOND, Withernsea.*

AT the time of thunder and lightning, some people shut their doors and windows, and make their houses as close as possible; others do the contrary: which is the more judicious plan?

(72) *By LEEDONIOUS, Beverley.*

WHY do grooms, and those who have the care of horses, usually whistle a varied note whilst watering them?

(73) *By Mr. WATERLAND, Thealby.*

ALE frequently becomes sour immediately after a violent thunder-storm: how is this to be accounted for?

(74) *By Mr. ENGLAND, Normanby.*

How is the sting of a nettle effected?

(75) *By Mr. DAIMOND, Hull.*

A PIECE of iron, heated till nearly red hot, assumes all the colours of the rainbow. Required the cause.

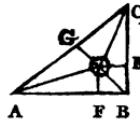


Answers to Mathematical Problems.

(107) *Answered by Mr. BURDON, Acaster Malbis.*

(For square root, read twice the square root.)

LET ABC be any right-angled plane triangle, and O the centre of its inscribed circle. Demit the perpendiculars G, F, E, and join AO, OB, and OC. The tri. AGO is equal and similar to AOF, and CGO to COE. Hence AG = AF, CG = CE, and AC = AG + GC = AF + CG = diam. of the circumscribed circle, and its area = $\overline{AF + CE}^2 \times .7854$; also that of the inscribed circle = $4 FO^2 \times .7854$, and that of the triangle ABC = $AOB + BOC + AOC = (AB + BC + AC) \div 2 \times FO = (AF + CE + FO) \times EO$. Now $\sqrt{AF + CE}^2 \times .7854 \times 4 \times 4 FO^2 \div 3.1416 + 4 FO^2 \times .7854 \div 3.1416 = \overline{AF + CE} \times FO + FO^2 = (AF + CE + FO) \times FO =$ the area of the triangle ABC, as above. Whence it appears, that the area of any right-angled triangle is equal to the square root of four times the product of the areas of the inscribed and circumscribed circles, divided by 3.1416, plus the area of the inscribed circle divided by 3.1416.



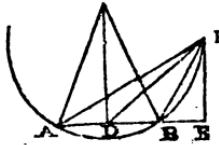
The same by Mr. Page, Westwood Cottage.

PUT OF, OG, or OE = a , AC = b ; then AF + EC will also = b , when EO and FO are at right angles to BC, AB. Let $.7854 = c$, and $3.1416 = 4c$: then the area of the triangle ABC = $ba + a^2$, which, by the question, is to be $= 2\sqrt{4a^2 b^2 c^2} \div 4c + 4a^2 c \div 4c$; this reduced is $ba + a^2$, the same as the triangle.

Also by *Messrs. Ambler, Baines, Killingbeck, M. Lamplugh, Mair, and Watson.*

(108) *Answered by SOLOMON LOB. c*

LET AB be the diag. of the pond, F the eye, C the centre of a circle, passing through A, B, F, and DC = DF; join AF, DF, BF, and draw FE \perp ABE; put EF = a , AB = $2d$, and DE = x ; then AE = $x + d$,



$BE = x - d$, $AF = \sqrt{(x + d)^2 + a^2}^{\frac{1}{2}}$, $DF = DC = (x^2 + a^2)^{\frac{1}{2}}$, $BF = \sqrt{(x - d)^2 + a^2}^{\frac{1}{2}}$, $AC = (x^2 + d^2 + a^2)^{\frac{1}{2}}$; $\therefore (x^2 + d^2 + a^2)^{\frac{1}{2}} : d :: 1 : d \div (x^2 + d^2 + a^2)^{\frac{1}{2}}$ sine $\angle BCD = \angle AFB$. Now, $2d : d \div (x^2 + d^2 + a^2)^{\frac{1}{2}}$ $\therefore (x - d)^2 + a^2)^{\frac{1}{2}} : \frac{1}{2}((x - d)^2 + a^2)^{\frac{1}{2}} \div (x^2 + d^2 + a^2)^{\frac{1}{2}} = \text{sine } \angle FAE$. Again, $1 : (x + d)^2 + a^2)^{\frac{1}{2}} :: \frac{1}{2} (x - d)^2 + a^2)^{\frac{1}{2}} \div (x^2 + d^2 + a^2)^{\frac{1}{2}} : a$. This analogy turned into an equ. &c. gives $x = 39,774$ feet, the dist. from the house to the centre of the pond.

We regret that want of room prevents us from inserting the ingenious answers to this problem by *Mr. England, Mr. M. Lamplugh, and Mr. Page.*

(109) *Answered by Mr. GOODISON, Eaton Bishop, Herefordshire; and Mr. KILLINGBECK, Barton-le-Willows.*

PUT $a = 11756$, and $b = 208$. From the sec. eq. $y = \sqrt{b - x}$. This value of y substituted in the first, gives $x + x^2 \sqrt{b - x} + bx^2 - x = a$; $\therefore x = 12$, and $y = 8$. Whence the time is 12th August.

Also by *Messrs. Ambler, Baines, J. Chapman, jun. Mair, Page, Smith, Tadman, Watson, Wilkinson, Wiseman, and Yorke.*

(110) *Answered by Messrs. AMBLER and BAINES.*

PUT $z^2 = x$; then the expression becomes z . Hence $z^3 Z$ is a min. (Z is the hyp. log. of z). In flux. $z^3 Z + Z \times 3z^2 z = 0$; but $\frac{z}{z} = z$; $\therefore z^2 z + Z \times 3z^2 z = 0$; \therefore the hyp. log. z (Z) $= -\frac{1}{3}$. Whence $h.l. z^2 = h.l. x = -\frac{1}{3}$. The nat. number corresponding to which, is .513417, the required value of x .

The same by Mr. WISEMAN, Hull.

PUT $y = x^{\frac{1}{3}}$; then $x^{\frac{1}{3}} x^{\frac{1}{3}} = y^{\frac{1}{3}}$; and $y^{\frac{1}{3}} \times h.l. y$ is a min. In flux. $3y^2 y \times h.l. y + y^3 \times \frac{y}{y} = 0$; $\therefore h.l. y = -\frac{1}{3}$; and $y = 1 - \frac{1}{3} + \frac{1}{18} - \frac{1}{108} + \&c. = \frac{10447}{145080} = .5134$.

Also by *Messrs. Chapman, G. Leng, Mair, J. Wilson, and Joseph Yorke.*

(111) *Answered by Messrs. BAINES, Jun. and PAGE.*

THE area of any right-angled triangle $=$ sq. of the hypot. multiplied by half the prod. of the nat. sines of the acute angles. $\therefore \sqrt{350}^2 \times \frac{.6 \times .8}{2}$ (nat. sines of $36^\circ 52' 12''$ and $53^\circ 7' 48''$) $= 29400 =$ the area. Put $x =$ part of the base adjacent to the acute angle, and $y =$ line of division; then $350 \times x \times .4 = 14700$, or $x = 105$; but $\sqrt{350}^2 + \sqrt{105}^2 - y^2 = 350 \times 105 \times 2 \times .6 = 44100$. Hence $y = \sqrt{99425} = 299.04$ yards.

Also by *Messrs. Ambler, Chapman, Killingbeck, G. Leng, Mair, Watson, Wiseman, and Yorke.*

(112) *Answered by Mr. Ford, Burton-Pidsea.*

FROM the sq. of the first eq. subs. the sec. and $xy^3 = 17496$, which taken from the sec. gives $xy^3 - y^3 = 1935^2$. Hence $xy^2 = 1944$; but $xy^3 = 19496 \therefore y = 9$; by substituting $81x = 1944$ and $x = 24$.

Also by *Messrs. Ambler, Baines, Chapman, Goodison, Killingbeck, J. Lamplugh, G. Leng, Mair, Page, Philomath, Smith, Tadman, Tindall, Watson, Wilkinson, Wiseman, and Yorke.*

(113) *Answered by the Rev. Wm. Wright, Curate of Haxey.*

LET $x =$ diam. and $p = 3.1416$; then $\sqrt{16 - x^2} =$ length; and $px \sqrt{16 - x^2} =$ curve surf. a maximum. In fluxions, and reduced, gives $x = \sqrt{8} = 2.828$ yards.

The same by Mr. ENGLAND.

PUT the diam. of the roller = x , $3.1416 = n$; then will the length = $\sqrt{16 - x^2}$; the circumf. = nx , and the curve surf. = $nx \sqrt{16 - x^2}$, a max. or $16x^2 - x^4 =$ a max. which, put into fluxions, and reduced, gives $x = \sqrt{8} = 2\sqrt{2}$; conseq. $\sqrt{16 - x^2} = 2\sqrt{2}$; theref. the length and diameter must be equal.

Also by *Messrs. Baines, Chapman, Ford, Killingbeck, J. Lamplugh, G. Leng, Mair, Page, Philomath, Smith, Watson, Wiseman, and Yorke.*

(114) *Answered by Mr. SMITH, St. Andrewgate, York.*

THE diam. of the field = 30; and (35. E. 3) $\frac{15+9}{15-9}x = 144 =$ rect. of the parts of the path; let $\therefore x$ and $144 \div x =$ the parts; and (per quest.) $\frac{x}{4} + \frac{48}{x} = \frac{x^2 + 192}{4x} =$ time spent in walking, a min. In fluxions, &c. $x = 8\sqrt{3}$; whence the chord of the segt. = $14\sqrt{3}$; its vers. 6.1612, and area = 104.715; \therefore the remaining part of the field = 602.145.

Also by *Messrs. Ambler, Baines, Burdon, England, Ford, Killingbeck, J. Lamplugh, G. Leng, Mair, Page, Watson, Wiseman, and Yorke.*

(115) *Answered by Mr. BAINES, Mr. GOODISON, and Mr. WATSON.*

$\sqrt{60^2 \text{ plus } 32^2}$ = slant side of cone. Conceive the cone to be bisected by a plane passing through its vertex; and let x = rad. of the larger globe, drawn perp. from its centre to the cone's side; then, by sim. tri. as $60 : 68 :: x : 32 - x$. This analogy, turned into an eq. and red. gives $x = 15$; conseq. the diam. = 30. Now as the superficies of globes are the sq. of their diam. $256 : 1 :: 3^2 : \sqrt{900 \div 256} = 1.875 = \text{diam. of less globe.}$

The same by Mr. WISEMAN, Hull.

By the quest. the diameter of the two globes are as $\sqrt{256} : 1$, or $16 : 1$; and are easily found = 30 and $30 \div 16 = 1.875$.

Also by *Messrs. Chapman, Lamplugh, G. Leng, Mair, Page, Tadman, Tindall, Wiseman, Wright, and Yorke.*

(116) *Answered by Mr. AMBLER, and Mr. ENGLAND.*

LET sum of the sides = s , rad. of inscribed circle = r , and $.7854 = n$; then area of tri. = $\frac{rs}{2}$ and $\frac{rs}{2s} =$ ratio of sum of the sides to the area. Again, $8nr =$ periph. and $4nr^2 =$ area of inscr. circle; conseq. $\frac{4nr^2}{8nr} =$ their ratio.

But $\frac{rs}{2s} = \frac{4nr^2}{8nr} = \frac{r}{2} ; \therefore s : \frac{rs}{2} :: 8nr : 4nr^2$. Q. E. D.

Also by *Messrs. Baines, Ford, Goodison, Lamplugh, G. Leng, Mair, Page, Smith, Watson, Wiseman, & Yorke.*

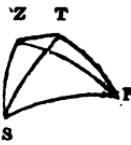
(117) *Answered by Mr. YORKE, Guisbrough; and Mr. SMITH, St. Andrewgate, York.*

LET x = globe's diam.; then $.5236 x^3$ = its solidity; $48^3 \times .7854 \times 12 = 21714.7392$ = content of the water in the vessel when half filled; and $48^3 \times .7854 \times x = 1809.5616 x$ = capacity of water and globe; hence $.5236 x^3$ plus $2714.7392 = 1809, 50616$; whence $x = 12.5784$.

Also by *Messrs. Ambler, Baines, England, Ford, Killingbeck, Lamplugh, G. Leng, Mair, Page, Wiseman, and Wright.*

(118) *Answered by Mr. HINE, Sergeant, 2d Royal Lancashire Militia.*

If Z shows the zenith of Yap, T that of St. Juan, P the North pole, and S the sun in the horizon ; then will ZP, TP, exhibit the colat. of the given places, angle ZPT = 8° their difference of longitude, and SP the sun's polar dist. In the sph. tri. ZTP are given ZP = 80° , TP = 62° and $\angle ZPT = 8^{\circ}$, to find TZP = $21^{\circ} 36'$.



As the zenith of each place is 90° from the sun, the tri. ZST is isosceles; consequently the $\angle TZS = 90^{\circ}$, and $\angle TZS - TZP = PZS = 68^{\circ} 24'$. Finally, in the tri. PZS, PZ, ZS and $\angle PZS$ are given to find $SP = 68^{\circ} 45'$ and $90^{\circ} - 68^{\circ} 45' = 21^{\circ} 15'$ the dec. answering to July 17.

Note. If the portion of the great circle ZT, which passes through the zeniths, were prolonged on each side, to the horizon, passing through S, there would result a semicircle ; this semicircle is the *locus* of those places that have a setting sun at the same instant, as Yap and St. Juan—and the semicircle below the horizon is the *locus* of those that have a rising sun.

Also by *Messrs. Baines, Darby, Wiseman, and Yorke.*

New Mathematical Problems.

(121) *By Mr. TINDALL, Pottery, Hull.*

Two notes, whose value, together, was £308 6s. 8d. (one due at the end of six months, the other at eight, at a certain rate per cent.) were presented to a Banker to be discounted. He received £8 6s. 8d. as premium : the interest of the two sums, each for its respective time, amounted to 4s. 8 $\frac{1}{2}$ d. more than the discount : find the value of each note, and the rate of interest.

(122) *By the Rev. W. WRIGHT, Hazey.*

THERE is a cube whose solidity is unknown ; but if one inch be added to its dimensions, it will add 1000 to its solidity : square its side.

(123) *By Mr. PAGE, Westwood Cottage.*

IN the triangle ABC, given the side AB = 13, AC = 14, and BC = 15: find the length of a line ED, parallel to the base AB, when the said line ED is to DA in the ratio of 4 to 9.

(124) *By Mr. AMBLER, Eaton Bishop.*

FIND two whole numbers, such that their sum and difference shall be both cubes.

(125) *By Mr. GEORGE LENG, Hull.*

$$\frac{1}{x^x}$$

FIND the value of x , when x^x is either a max. or min.

(126) *By Mr. WATSON, Beverley.*

Given $x = 12$ plus $8\sqrt{x} \div x - 5$: required the value of x , by a quadratic.

(127) *By Mr. THOMAS FORD, Burton Pidsea.*

DETERMINE that point in the arc of a quadrant, from which two lines being drawn, one to the centre, and the other bisecting the radius, the included angle shall be the greatest possible.

(128) *By Mr. GOODISON, Eaton Bishop.*

To find two numbers, such, that the difference of their squares, and the difference of their cubes shall be both squares.

(129) *By Mr. SMITH, St. Andrewgate, York.*

THE solidity of a cylindric ring is 789.568; find the thickness and inner diameter, when the latter is equal to the square of the former.

(130) *By Mr. KILLINGBECK, Barton-le-Willows.*

Two persons, A and B, purchased a triangular field, consisting of two different values, or qualities of land, for the sum of £576, of which each paid an equal part. They have divided it betwixt them, by a line parallel to the base. Now A's share, which lies next the vertex, is worth £24.

and B's £36 per acre: also the segments of the base, made by a perpendicular from the vertex, are 14 and 11 chains. Find a point in the shortest side, also the length of the division fence drawn thence.

(131) *By PHILOLAUS, Leverley.*

IN ORDER to ascertain whether a given number a be a prime number, it is only necessary to solve the equation a^2 plus $y^2 = z^2$, a *minimum*. Required the proof.

This is the 9th prob. pa. 258 of the ingenious work *On Numbers*, by Mr. BARLOW.

(132) *By Mr. CHAPMAN, Land-Surveyor, Hull.*

DETERMINE, universally, the error in measuring the frustum of a cone, by the common method of reducing it to a cylinder.

(133) *By Mr. ENGLAND, Normandy.*

A GIVEN triangle is immersed, vertically, in a fluid, so that one side is coincident with the surface of the fluid. Divide it by a line, parallel to the surface, so that each part may be equally pressed.

(134) *By Mr. BAINES, Jun. London.*

FROM any point P, in a given right line AB, let a perpendicular $PL = AP \times PB \div AB$, be erected. It is required to determine the equation and area of the curve which is the locus of L; also the content of the solid generated by the curve ALB about its axis AB.

(135) *By Mr. WISEMAN, Hull.*

A CORB of coals weighs 400 lbs; and the time between the dropping of a stone down the shaft of a coal-pit and hearing the sound of its striking the bottom is $7\frac{1}{2}$ seconds. Required the depth of the pit, and the difference of the weights of the corb at the top and bottom of the pit.

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Mr. EDITOR,

READING lately the *Monthly Review* for 1783 and 1784, I met with a full account of the controversy betwixt Bishop Horsley and Dr. Priestley, which induced me to conclude that a biographical memoir of the former, he being a profound Mathematician, would be interesting to many of your readers. I therefore turned to the *Monthly Magazine*, *Philosophical Transactions*, *Cyclopaedia*, &c. and collected all that suited my purpose, which I transmit to be used as you think proper. You will find some occurrences respecting his Lordship, that have not yet been generally known: mathematicians only, deal in demonstrable articles; therefore, when truth is not conspicuous, the most humble in society frequently detect the most lofty when deviating from her path.

Yours, &c.

CLASSICUS.

Lincoln, October 10th, 1815.

DOCTOR SAMUEL HORSLEY, the eldest of the three sons of the Rev. Mr. Horsley, formerly Minister of St. Martin in the Fields, was born in the year 1737, and was educated at Westminster school, till he was removed to the University of Cambridge; there he applied chiefly to the study of the Mathematics; and, not content with carefully reading the writings of modern authors, he went back to the most profound of the ancients, and made himself master of their most intricate reasonings.

Having taken his degree of Master of Arts, he accepted an invitation to go to Oxford, as private tutor to the Earl of Aylesford. At this University, he received a degree of Doctor of Laws; and in 1769, printed, at the Clarendon press, his editions of the *Inclinations of Apollonius*, a geometrical work of considerable value, though exceedingly abstruse.

Previously to this time, mathematical learning had been in little repute at Oxford, but since that period, it has been considered more estimable; so that this University can hardly be said to fall short of her sister; in that great and useful branch of human knowledge. And notwithstanding what ignorance or prejudice may advance to the contrary, the writer of this asserts, that these institutions preserve science from falling to the ground in England.

At this College he first conceived the design of publishing a complete edition of the works of Sir Isaac Newton; for which he began to collect the necessary materials.

On leaving the University, Dr. Horsley came to London, where he was elected a fellow of the Royal Society, of which he was also chosen secretary in 1776. He continued to serve that office with the greatest credit to himself, as well as benefit to the scientific world, till the resignation of the late president, Sir John Pringle, when finding that the connoisseurs and virtuosi were gaining ground, he retired.

Soon after his settling in the metropolis, he accepted the office of Chaplain to Bishop Lowth, who presented him to the Rectories of St. Mary, Newington, and Albury, both in the county of Surry; and about the same time he married a Miss Botham.

In 1776, he published proposals for a complete and elegant edition of the works of the immortal Newton, which appeared in 1779, in five volumes, royal quarto, with an excellent dedication to the King, in Latin. The merit of this work has been differently appreciated: some think highly of it, others the contrary. The late Mr. Reuben Burrow, a first-rate mathematician, says the learned Dr. Horsley, after having shewn in innumerable places of his Edition of Newton, that he does not understand his author, at page 299 and 320, &c. vol. 2, that he *knows nothing of what is meant by a second fluxion*; at

page 441, positively asserts, without any kind of proof, that *Brook Taylor's* proportion $tr : t B :: B l : B.S$, in the 9th Lemma of his Method of Increments, is false!—Now as this proposition, says Mr. Burrow, in his Diary, is undoubtedly true, and the Doctor's assertion entirely the reverse; it is required (for the sake of *young fluxionists*) to point out the causes of the Doctor's error.

In 1778, when the controversy was on the carpet between Doctors Priestley, Price, and others, respecting Materialism and Philosophical Necessity, Dr. Horsley preached a sermon on Good Friday, at St. Paul's Cathedral, which he afterwards published. In this ingenious discourse he reconciles, with much force of argument, the doctrine of Divine Providence with the free agency of man, and combats the necessarian hypothesis with much ability.—About this time he was appointed Archdeacon of St. Alban's, by Bishop Lowth, who, in 1782, presented him to the valuable living of South Weald, in Essex.

In 1783, Dr. Priestley published his celebrated work, the History of the Corruptions of Christianity; the principal design of this was to overthrow the Catholic doctrine respecting Christ's divinity. Great was the triumph manifested by the Unitarian party on the publication of so elaborate an history. The outcry made by them on the occasion, naturally roused the attention of those who adhered to the orthodox confession; and Dr. Horsley seized this opportunity of showing not only the soundness of his faith, but his abilities for the most intricate branches of theological controversy. In the summer of this year, he delivered to the Clergy of the Archdeaconry of St. Alban's, a Charge, in which he expressly controverted the Socinian position—that the doctrine of the Trinity was not maintained by the Christian church in the first three centuries; and he not only gave a flat contradiction to Dr. Priestley's assertion, on this point, but charged him with having taken, without acknowledgment, the whole of his argument from Zwicker, and other eminent Socinians of the last century. This discourse, at the request of his reverend auditory, was printed, with an appendix, explaining and confirming the positions which it contained. Dr. Priestley, with the impetuosity of

man who seemed to place all his reputation as a combatant upon the event of this contest, instantly replied to the Archdeacon, in a series of letters, which contained all his former assertions, expressed in a more confident tone than before.

Dr. Horsley was aware of the advantage which the precipitancy of his opponent had given, and therefore in his answer, which was also in the epistolary form, he noticed the frequent slips in Greek quotation and reference which the Dr. had made; and, with great adroitness, left it to the reader to judge whether so hasty and incautious an historian was to be depended upon in a matter of such importance. But he did not merely expose the Doctor's mistakes: he followed up the attack by numerous proofs in behalf of the common belief, drawn from the early fathers of the church, and the purest ecclesiastical historians. The display of style also is admirable; and though, at times, it assumes a lofty manner, yet the reader of taste finds himself charmed with the elegance of the language, and the closeness of the reasoning. Dr. Priestley continued the combat by another series of letters, to which the Archdeacon again replied. The controversy here closed on the part of the latter; who signified that it was an endless task to contend upon an exhausted topic with one who was never disposed to cease to dispute till he had obtained the last word. In 1789, Dr. Horsley collected these Tracts, and printed them in one volume octavo, with some additions, particularly a sermon on the Incarnation, preached at Newington, on Christmas day, 1785; and as it had a material relation to the controversy in question, he thought proper to insert it in this collection.

While this dispute was going on, Dr. Horsley was engaged in another, which made nearly as much noise as the former, at least in the scientific world. When Sir Joseph Banks came in as president of the Royal Society, on the resignation of Sir John Pringle, the mathematical and philosophical members of the Newtonian school were disgusted at the extraordinary preference which was shewn to subjects, as they conceived, of an inferior nature to those which ought, in their opinion, to engage the first learned society in the world. It has been said that cabals were formed by those members of the old stamp against the president and his friend; but of this no proof was

adduced. In 1784, the latter ventured upon a step which could not fail to fan the smothered flame into a blaze. The council thought proper to dismiss the learned Dr. Hutton from the office of Latin secretary for foreign correspondence, upon the very frivolous pretence that it was improper such a post should be filled by a person who did not reside in the metropolis. The scientific members took fire at this treatment of one of the ablest and most respectable of their body. Accordingly, in several meetings of the society, attempts were made to lessen the influence of their president, and re-instate Dr. Hutton in his place, but without success. In this contest between philosophy and the virtuosi, Dr. Horsley made the most conspicuous figure. Finding, however, that his labours, and those of his learned associates, were in vain, he forsook (to express it in his own forcible language) "that temple where philosophy once reigned, and where Newton presided as her officiating minister."

In 1786, Dr. Horsley obtained, without either solicitation or expectancy, a prebend in the Cathedral church at Gloucester. His friend, on this occasion, was Lord Thurlow, then Chancellor; who, without being personally known to Dr. Horsley, or receiving any application on his behalf, resisted every request that was made for this valuable preferment, and bestowed it upon the man whom he justly considered as having merited it the most of any divine in this age.

In 1788, Dr. Horsley was elevated to the Episcopal Bench, on the translation of Dr. Smallwell, from the See of St. David to that of Oxford. Lord Thurlow, on this occasion, was again his steady and unsolicited patron, and made it a point to bring in his friend, in opposition to the candidates who were backed with all the force of ministerial influence. On the great struggle made by the Protestant Dissenters, 1779, to obtain a repeal of the Corporation and Test Acts, a pamphlet appeared, entitled *A Review of the Case of the Protestant Dissenters*, which was written with such boldness and elegance, on the high church side, that, though anonymous, all parties concurred in attributing it to the Bishop of St. David's; nor were they wrong in their conjecture.

His conduct in the See of St. David's was highly praiseworthy. Of all the Bishoprics, no one exhibited more poverty, or more ignorance on the part of the Clergy than this. Many of the curacies, when his Lordship entered upon the government of this extensive diocese, did not exceed £10 per annum; and some of the churches were actually served for £5. It may easily be concluded what sort of Divines a great part of these poor Ministers were in such circumstances. What was still worse, the multitude of candidates for orders increased yearly; so that Wales poured forth her superfluous Clergy into England, to the disgrace of the cloth, and the real injury of such as were regularly bred. A reform was therefore necessary; but it required a strong and vigorous mind to accomplish it.—Dr. Horsley was not to be daunted by any obstacles. He obtained, with the greatest possible dispatch, an accurate and minute state of his Clergy. He then gave notice to his beneficed Clergy, who did not reside, that they would be compelled to residence, or to allow their Curates a more liberal salary. By these means he remedied that shameful abuse, of one man's serving several churches on the same day, directing that a Curate should serve only two, and those within a moderate distance from each other. Having regulated the condition of the Clergy, he proceeded to a stricter course with respect to candidates for Holy Orders; admitting none without personally examining them himself, and looking very narrowly into the titles which they produced. With all this vigilance his Lordship acted to them as a tender father, encouraging them to visit him during his stay in the country, which was usually for several months in the year, assisting them with advice, and administering to their personal necessities, with a liberal and paternal hand. In his progress through the diocese, he frequently preached in the parish churches, especially on the days when the sacrament was administered, and bestowed considerable largesses upon the poor. He kept a most hospitable table at his Episcopal Palace, at Aberguilly, near Caermarthen, to which the neighbouring gentry and clergy were always welcome. In short, he was a blessing to his people, and they followed him with grateful hearts, and parted from him with infinite reluctance.

On January 30th, 1793, the Bishop of St. David's was appointed to preach before the House of Lords, and as the recent execution of the King of France was the general topic of conversation and pity, the Abbey was greatly crowded. That discourse is in print, and whatever may be thought of the notions of government that distinguish it, there can be but one opinion concerning its very beautiful and pathetic peroration. When published, the Bishop appended to his sermon, a long vindication of the character of Calvin, from the charge of being a friend to rebellion and regicide.

The following year he was translated, on the death of Bishop Thomas, from St. David's to Rochester, and to the Deanery of Westminster, on which he resigned all his other church preferments. When he entered upon his office as Dean of Westminster, he found many things in that church which stood in need of reformation; and, with his usual activity, he set about the work. In particular, the salaries of the minor canons and officers were extremely low, and by no means proportionate. With a most commendable spirit of liberality, he therefore obtained an instant advance, and then began to regulate the conduct and duty of the persons whom he had so materially assisted.

In 1796, he gave the public a most profound and elegant dissertation on the Latin and Greek Prosodies, dedicated to Lord Thurlow.—In this learned performance, he shows an uncommon depth of penetration into, and acquaintance with, the nature and construction of the ancient languages, and proves himself a most powerful, though perhaps not an invincible advocate for the use of the Greek accents. In the year 1800 was published, the Substance of the Bishop of Rochester's Speech in the House of Peers, May 23d, in the debate on the third reading of the Bill for the Punishment, and more effectual Prevention of the crime of Adultery: which combines all the energy of diction and vigorous turn of thought that characterizes the rest of his productions; but many of his arguments are founded on doubtful construction. In the same year, appeared, in quarto, his Critical Disquisitions on the Eighteenth Chapter of Isaiah, in a Letter to Edward

King, Esq. This chapter has been ranked among the abstruse passages of ancient prophecy, and various have been the endeavours of biblical scholars to illustrate it. Discarding all previous assumptions concerning the design of this prophecy, the people to whom it is addressed, and the history of the times to which it belongs, Dr. Horsley proposed to enter into a critical examination of every word of which the meaning is at all doubtful, scrutinizing etymologies, exploring usages, and consulting translations; and he conceived that every word should be considered of doubtful meaning which has been taken in different senses by different interpreters of note. He likewise published, in 1800, a Charge to the Clergy of his Diocese, delivered at his second general visitation, in which he indignantly reprobated the principles of the French philosophers and German illuminati; and proceeding to notice the state of religion in this country, he expressed some apprehension concerning the progress of Methodism.

In 1801, the Bishop of Rochester published an octavo volume, entitled, Elementary Treatises on the Fundamental Principles of Practical Mathematics, for the use of Students. Although published first, it is the last in order of three volumes of Elementary Geometry, which this Prelate sent forth from the Clarendon press. The other two volumes were in Latin, and the last of them made its appearance in 1803.—The first volume contains the twelve books of Euclid, with the author's corrections; the second Euclid's Data, a Book on the properties of the Sphere, Archimedes on the Dimensions of the Circle, and Dr. Keil's elegant Treatise on the Nature and Use of Logarithms; and the third, in English, consisted, according to the title, of Elementary Treatises. In 1802, this indefatigable Prelate published a new Translation of the Prophet Hosea, with notes critical and explanatory, which evince profound erudition and patient perseverance. He was, in the same year, on the demise of the Hon. Dr. Bagot, translated to the more lucrative See of St. Asaph. In 1804 was published, the substance of his Speech on the 23d July, on the Bill for the relief of certain incumbents of livings in London. In behalf of this measure, the Bishop argued with fairness and ability. Soon afterwards appeared his

sermon on Christ's descent into Hell and the intermediate State, from Peter iii. 18, 19, 20, which was intended to have formed part of the appendix to the second edition of his Translation of Hosea.

In 1805, Dr. Horsley printed a Critical Essay on Virgil's two Seasons of Honey, and his Season of sowing Wheat; with a new and compendious method of investigating the Risings and Settings of the fixed Stars; and on the 5th of December, in the same year, he preached, in the Cathedral of St. Asaph, a sermon, which he afterwards published, under the title of The Watchers and the Holy Ones.— This last literary performance of the learned Prelate was composed of two parts, theological exposition and political reflection, and breathes the same spirit that pervades all his writings.

Dr. Horsley died at Brighton, on the 4th of October, 1806. No man of the age perhaps possessed more of what is generally termed recondite learning, or was more profoundly versed in classical chronology. As a senator, he was considered in the first class; there were few important discussions in the House of Peers, especially when the topics referred to the hierarchical establishments of the country, to the French Revolution, or to the African Slave Trade, of which he was a systematic and eloquent opponent, in which his Lordship did not participate. As an orator, his voice was deep, full-toned, and commanding; his enunciation distinct, and his delivery in other respects highly advantageous. His manner was rather dictatorial, yet he was nevertheless an argumentative speaker. He has been accused of superciliousness and a spirit of persecution; and while it cannot be denied that in the heat of controversy his temper was disposed to rise too high, and to vent itself with too much energy against his opponents, it must at the same time be admitted, that he was animated in the cause of truth and virtue, and that he exercised his severity only on what he considered as falsehood, sophistry, and vice. Though he had attained the age of sixty-nine, the powers both of his body and mind were so vigorous as to promise still a considerable length of years. His remains were interred at Newington.

Since the death of the Bishop, two volumes of his Sermons have been given to the world by his son. He left behind him, in manuscript, but ready for the press, a translation of the Book of Psalms, with notes; a Treatise on the Pentateuch, and on the Historical Books of the Old Testament; a Treatise on the Prophets, containing notes on Isaiah, Jeremiah, Ezekiel, Joel, Amos, and Obadiah.

OF THE ANTIQUITY, EXCELLENCE, and USE of DIVINE MUSIC, in PRIVATE or PUBLIC WORSHIP.

Continued from page 204.

THE use of singing psalms and hymns was continued with great reverence and devotion amongst the Primitive Christians; those who consult the writings of the Fathers, shall scarcely meet with one that makes no mention thereof. An account of which, I find learnedly discoursed by Dr. Cave, in his Primitive Christianity, Part I. pa. 276, 277, where, speaking of reading the appointed lessons, he has these words:—About this part of the service it was they sung hymns and psalms, a considerable part of the divine worship, (as it had ever been accounted both amongst Jews and Gentiles) and more immediately serviceable for celebrating the honour of God, and lifting up the minds of men to divine and heavenly raptures. But to come nearer our times—in our late forefathers' days (upon the restoration of our church to its primitive purity and discipline) it was, that some holy and godly men brought the present use and manner of singing psalms into the public service of our church, following herein the examples of the reformed churches in France and Germany. It was the saying of a learned divine, in his sermon on this subject, that prayer shall cease, and preaching shall cease; but praising of God shall never cease, neither in this world, nor in that which is to come.—To sing praises to God is an angelic office; it is a taste of the first fruits of heaven while we are on earth. Music (the learned say) is the hand-maid to divinity; and there is no science except that admitted into the service of the church.

Singing of psalms, says Mr. Chetham, is so fit a part of divine service, so natural an expression of joy, and serves to so many noble ends, that it comes recommended to us by the practice of all nations, seems to be as ancient as public worship, and has had the good fortune to be approved of by all parties, of what denomination soever; and therefore the psalmist directs his precept, not to any peculiar church of God, but to all lands, to serve the Lord with gladness, and to come before his presence with a song. It has that force upon the passions, so as to compose our thoughts, to dissipate our sorrows, and to enliven our devotion: it suits the spirits when heavy with grief, or exalted with joy, and brings them into a temper of grateful seriousness. How ravishing and delightful is this exercise, when performed with skill in a becoming manner! and how much unlike itself, when made up of harsh and disagreeable sounds! They must have very inharmonious souls, who can hear the one without pleasure, or the other without pain: I may appeal to a great many of our country congregations for the truth of this; and yet with how much difficulty are they persuaded to sing in tune, or to forsake what they have been accustomed to. What terrible outcries do they make (such force has prejudice) against any alterations; and, if their understanding does not help them to any arguments against the thing itself, they immediately cry out *popery!* —a frightful word, often made use of by such as have neither knowledge enough to judge of a thing, nor prudence to let it alone. It is a happiness often wished for, that this religious exercise appears to be more esteemed, and, (being an essential part of the duty and homage we owe to the Divine Majesty,) that a more decent performance of the same seems to be countenanced and encouraged by the higher rank of the community: this will be a means to add to the church daily, and make us glad to go into the house of the Lord: this will tend so to excite and heighten the devotional passions, and so to move the affections of the mind towards God, that our psalms and hymns will become spiritual songs, when in imitation of the blessed chorus above, we sing unto the Lord with grace in our hearts, and with the voice of melody. By this means, the heavenly exercise of singing

psalms, hymns, and anthems, will take place, instead of those wanton and profane songs and ballads, with which we are continually disturbed in every corner of our streets, and which, to the scandal of christianity itself, are introduced into almost all sorts of company, and, (as it is rightly expressed in the title page of our singing psalms) do serve only for the nourishing of vice, and the corrupting of youth. As it is well known that these two sorts of music cannot subsist together, but wherever one is held in esteem, the other declines ; therefore, we have reason to hope, that if this design continues to be encouraged, it may destroy that great engine, with which the devil ruins the souls of men ; and that God will again perfect his praise from the mouths of babes and children, whose hearts may receive the good seed, before the enemy hath an opportunity to sow the tares, and it may take root and prosper accordingly. It was the saying of the Divine Herbert, in his Poems, p. 1.

“ A verse may catch him who a sermon flies ;

“ And turn delight into a sacrifice.”

The Right Rev. the Lord Bishop of London, in his Directions to the Clergy of his diocese, gives the following advice concerning psalmody :—Besides that part in our public devotions, which properly belongs to the minister, there is another, which, though it belongs to the whole body of the congregation, will hardly be performed in a decent and edifying way, without some previous care and assistance on his part ; I mean the singing of psalms : this is a divine and heavenly exercise, which the scripture recommends to us as one special means of edification ; and being then in its greatest perfection, when it is performed by christians in a joint harmony of heart and voices, it has been accounted a standing part of public devotion, not only in the Jewish, but in the Christian church ; and in the Church of England particularly, whose Sunday service is made up of three offices, which were originally distinct, and in their natures are so, there is the greatest need of the intervention of psalmody, that the transitions from one service to another may not be too sudden and abrupt ; this exercise, therefore, being a part of our public devotions, and very useful when it is duly and regularly performed, must not be forgotten, while we are considering of proper

rules for decency and edification in the church; especially since it is plain in experience, that where no care is taken in this matter, the performance will be very indecent, and even shocking.—To prevent that, and to provide for due solemnity in this part of our public service, I have often wished that every minister would take the trouble of directing the choice of proper psalms, or rather that they would once for all fix and establish a course of psalms, to be given out and sung in their order; and to the end, the psalms so chosen, may be sung in a more decent manner, it is further to be wished, that the people of every parish, and especially the youth, were trained up and accustomed to an orderly way of singing some psalm tunes, which are most plain and easy, and of most common use, since that is the proper season of forming the voice, as well as the mind, and the regularity into which it is then cast with great ease, will remain with them during life; and not only enable them to contribute their part to the decency of this performance, but even, for the sake of that talent, will incline them to be constant in attending the public service of the church.—But when I recommend the bringing your people, whether old or young, to a decent and orderly way of singing psalms, I do by no means recommend to you, or them, the inviting or encouraging those idle instructors, who, of late years, have gone about the several countries to teach tunes uncommon and out of the way; which very often are as ridiculous as they are new, and the consequence of which is, that the greatest part of the congregation being unaccustomed to them, are silenced, and do not join in this exercise at all; but my meaning is, that you should endeavour to bring your whole congregation, men and women, old and young, or at least as many as you can, to sing the plainest and best known tunes, in a decent, regular, and uniform manner, so as to be able to bear their part in them at the public service of the church. If what I have said under this head, (says he) concerning psalmody, shall be thought a point too little to be taken notice of, let it be remembered, that nothing can be called little which conduces in any degree to so great an end, as is the decent and orderly performance of the public worship of God.

This advice of the Bishop was printed in the year 1724, when the churches had been long accustomed to Mr. Playford's tunes, which perhaps made his Lordship speak against such persons as taught tunes of new books, (several of which were then in print, and more have been printed since,) for though these new authors have made some improvement in the melody and harmony, yet they have made very little in the reading or solfaing: and as to their tunes, there is scarcely one author, who has not several of them in his book, which are of little or no use to country congregations. J. Y.

Guisborough, June 21st, 1815.

ON THE HYMNS OF THE METHODISTS.

Fiat Justitia ruat Cœlum.

SOME time ago, I happened to take up a number of that venal publication, *The Satirist*, which contained several quotations from Wesley's hymns, with remarks, which made them appear in a very ludicrous and almost blasphemous point of view.—The singular garb in which they there appeared, caused me to refer to one of their hymn books, printed at the Conference office, (for I am told such only are genuine editions,) when, to my surprise, several of the hymns quoted and referred to in that publication, were not to be found; and the sense of such as I did find, so tortured and garbled, that it bore a meaning quite different from that which it did in its proper place. Although I never was a Methodist, I am a lover of justice, and am determined to admire and acknowledge excellence wherever I find it; whether in the Churchman or the Dissenter. I have met with no hymns in the English language superior to those written by Messrs. John and Charles Wesley, (for they have not distinguished their productions: they both wrote hymns, but the greater number was written by Charles) ; and with the exception of Dr. Watts's and the Olney collection, some of which were written by the amiable and excellent Cowper, very few equal to them.—Their large hymn book, although principally the hymns of the two Wesleys, is evidently a collection from different authors; and it is to be regretted

that it has not been the practice in this and other selections of hymns, to annex to each hymn the author's name; this, justice requires, should be done.—That the reader may form his own judgment of the merits of those compositions, I have taken a few specimens from the *Conference Edition* of Wesley's hymns, all of which (as far as I know) have been written by one of the Wesleys.

The *unprejudiced* reader will be pleased with the universality of the sentiment, and the elegant imagery of the following stanzas: (Page 418.)

JESUS, let *all* thy lovers shine,
 Illustrious as the sun;
And bright with horrow'd rays divine,
 Their glorious circuit run.

Beyond the reach of mortals spread
 Their light where'er they go;
And heavenly influences shed
 On all the world below.

The genuine piety expressed in the following lines, is
simply elegant:—

Lord, that I may learn of thee,
Give me true simplicity;
Wean my soul, and keep it low,
Willing thee alone to know. (Page 291.)

The following may serve as a specimen of the solemn style:

Pass a few swiftly fleeting years;
 And all that now in bodies live,
Shall quit, like me, the vale of tears,
 Their righteous sentence to receive.

But all, before they hence remove,
 May mansions for themselves prepare,
In that eternal house above;
 And, O my God! shall I be there? (Page 50.)

From a funeral hymn:—

THIS languishing head is at rest,
 Its thinking and aching are o'er;
This quiet immovable breast
 Is heav'd by affliction no more.

This heart is no longer the seat
 Of trouble and torturing pain;
 It ceases to flutter and beat,
 It never shall flutter again. (Page 51.)

Specimens of the more lively strain :—

COME ye that love the Lord,
 And let your joys be known,
 Join in a song with sweet accord,
 While ye surround his throne :

Let those refuse to sing
 Who never knew our God;
 But servants of the heavenly king
 May speak their joys abroad. (Page 17.)

Away with our sorrow and fear,
 We soon shall recover our home :
 The city of saints shall appear,
 The day of eternity come :

From earth we shall quickly remove,
 And mount to our native abode,
 The house of our father above,
 The palace of Angels and God. (Page 75.)

Resignation to the divine will :—

WHEN pain o'er my weak flesh prevails,
 With lamb-like patience arm my breast;
 When grief my wounded soul assails,
 In lowly meekness may I rest. (Page 23.)

SAVIOUR ! where'er thy steps I see,
 Dauntless, untired, I'll follow thee;
 O let thy hand support me still,
 And lead me to thy holy hill !

If rough and thorny be the way,
 My strength proportion to my day,
 Till toil and grief and pain shall cease,
 Where all is calm, and joy, and peace. (Page 321.)

The above are not selected as the *best* specimens that may be met with in that excellent Collection, but such only as have come under my own observation.—I could multiply others innumerable of equal or superior merit.

with the above, were I not afraid your readers are already weary of the subject; but these few may serve to convince those who have never drunk at the fountain-head, that at least *some* of the hymns of the Methodists are neither defective in respect to sentiment or elegance. Z.

AGRICOLA TO VIRIDE LIGNUM.

YOUR critique is ended, and I am disappointed. I expected after all the misrepresentation, nonsense, and invective, which stained your former letter, in which you at once violated candour, common sense, and good manners, that in this a direct blow would be given to my reasonings. Believe me, Sir, it is not because you have failed to give me opportunity; I revere those virtues you have set at nought, and what is worth your notice, I have too much regard for the understandings of our readers to retaliate. I shall, in this epistle, content myself with proving that *agriculture is the source of wealth to Britain*; for I am by no means satisfied, nor are our readers, with your bare assertion, that '*commerce is the chief prop of our greatness.*'

I am no oeconomist:—I agree with that class of political philosophers in their fundamental axiom, that all wealth is ultimately derived from the soil; but am not such a dizzard as not to perceive the supreme importance of manufactures as a stimulus to its productiveness, and as a means of converting the speedily perishable produce of the earth, into wealth that is more permanent, and almost equally essential to the use and comforts of man. By their aid, agriculture, at the very time when our commerce was annihilated, enriched all classes of society;—the farmer became wealthy, and, by the duplication of his rents, enriched the landholder. These two classes, with their immense host of dependants, whose circumstances were proportionably ameliorated, augmented the wealth, and multiplied the exertions of the manufacturers; who, with the exception of those employed in the fabrication of articles for exportation, were, together with the shop-

keepers, in a state of unexampled prosperity. Taxes, though doubled, were paid without a murmur; and as I observed in my last, which is by the way an irrefragable reason, the population of the nation increased in more than a two-fold ratio!—But to quit the argument derived from experience, which is positively unanswerable, and renders ridiculous your wise assertion, that ‘when commerce is taken away, agriculture declines,’ let us compare the wealth derived from the soil, with the revenue arising from foreign commerce.—If it be admitted that the manufacturer does not create, but simply transmutes the more perishable productions of the earth, into wealth that is more durable; 240 millions, the annual value of our internal trade, is a tolerably correct estimate of the wealth which agriculture yearly creates. But lest you should deny the authority of this reasoning, let us have plain matter of fact; let us refer to the statistics of Mr. Colquhoun*. He says that in 1812, the new wealth created by agriculture was £216,817,124; while that produced by foreign commerce was £46,373,784; that is, little more than a fifth as much. What then becomes of your absurd position, that ‘*commerce is the chief prop of our greatness.*’

Agriculture is then the source of wealth to Britain, and I can triumphantly reply to your sneering questions:—it has enabled the shopkeepers of the metropolis to exhibit unparalleled rarities, culled from all quarters of the globe;—it has raised the farmer from misery to splendour;—it has covered England with an ægis, and enabled her single handed to wage war with the old world and the new; to rescue enslaved nations; and having put down coalition after coalition, to dash the sceptre from the hand of the most impious homicide that ever cursed the human race. Without agriculture, machinery and manufactures had still been kept asunder; that glorious tribute of philosophy to the arts, the steam engine, had not yet been known. It has given us ships, colonies, and commerce; it has rendered our country a paradise, and our homes delightful.

It now only remains for me to say a word or two in behalf of the farmers, a race of men you have vilely calumniated. Many causes conspired to increase the demand for the produce of the soil, and to enlarge its value. We may instance the high state of taxes, the extension of our manufactures from the aid of improved machinery, the death of foreign commerce, and the augmented population of the country. Capitalists only could now afford to cultivate the soil; the poor peasants were compelled to forsake the homes of their fathers; their cottages were razed to the ground; and large farms arose from the ruin of many small ones. Agriculture became the employment of the merchant, the country gentleman, and the man of science; hence its rapid improvement, and hence the affluence of the new class of cultivators. If you suppose the remnant of the ancient race, those whose former penury have enabled them to cultivate ten times as many acres as they tenanted before, have been guilty of the fooleries you have imputed to them, you are as piteously ignorant as you are grossly malevolent. The character of the British farmer has been oftentimes the theme of eulogy; I shall not attempt to enlarge his honours. Philosophers and poets have conspired to do them homage. Against the poetry and eloquence of our Thompsons and our Goldsmiths, of our Smiths and our Spences, your invectives may be likened to the snarlings of an ill tempered cur. May their praises be eternal—but, alas! their prospects are any thing but cheering. Corn below the cost incurred in raising it, the prices of stock declining every day, wages unaltered and taxes increased, all the comforts of life retaining their former high prices, and all the necessary luxuries too costly to be procured, have reduced the farmer to poverty, and the tenant to despair. The multiplication of poor-houses does not keep pace with the increase of paupers, and the prisons of the nation scarcely contain its bankrupts. The evil rests not here—the shopkeepers, who are less able to accommodate themselves to adverse circumstances, and whose capitals are in the hands of others, never to return, without profit and without trade, are on the brink of ruin.—Desolation is on her march;—the bills of the manufacturers are dia-

honored; they are without orders, and are daily turning of their hands. Thousands are, and millions will, shortly be without bread. Amongst the industrious classes of society, you meet on every turn with rueful faces ; and nothing is heard but the sighs of hopeless poverty, and the vociferation of oppressed misery. Tax-gatherers are worn down with their endless and hopeless labours :—The times are out of joint, and it only remains for us to hope, that men who hold sentiments so dangerous as yours, will not attempt to set them right.

Beverley, October 15th, 1815.

AGRICOLA.

REMARKS ON HAPPINESS.

(Concluded from our last.)

THE saying in this country is very general, “that a rolling stone gathers no moss,” or in other words we attach the idea unsettled, unhappy, to that person who never stays long in a place. How far this is true, as it respects the Indians, of whom our author speaks, I cannot say ; but I imagine in America, as in this country, one place is naturally more pleasant, more delightful than another ; and to be under the necessity of quitting such places, for an uncertainty, to go they know not whither, must, if those Indians have any feeling, cause some regret ; and if so, what becomes of their *boasted happiness*.—Instead of the sparkling eye and smiling countenance, I imagine we should observe the watery eye and the down-cast look.

When a man, either in an argumentative or military point of view, has been trying to maintain a position, which is scarcely tenable, no great wonder if his own weapons are turned against himself. For instance, at page 250, our author says “were it possible for man to attain the perfection of knowledge, he would then be completely happy.” What use Mr. F. would have us make of this, I cannot say ; but the inference I draw is, that although man cannot attain the perfection of knowledge, yet as this article has a tendency to promote our

happiness, and as there are many subjects with which we can make ourselves acquainted, and of which we can obtain some information—the more we attain, the more likely, if we use it rightly, will it be to make us happy.

With feelings, the result of experimental religion, I am unfortunately not much acquainted; but those who are, tell us that there is no real happiness but in exercises of this sort. What becomes then of the happiness of those who worship only graven images?

When Mr. F. says that we have seen men who have cracked their brains, and made themselves miserable by thinking too much, are we to infer that it is better not to think at all from a fear of like consequences? If so, I would only tell this gentleman that where there is one who is made unhappy by this exercise, there are thousands miserable for the want of it.

Although it is admitted that man is fallible, still it is desirable and pleasing to have, on any subject, the opinions of those whose knowledge and experience have made them of some importance in the world. On a slight examination then I have the pleasure of finding myself in the company of some of the greatest men that ever lived—men who are constantly reprobating ignorance, and as constantly praising knowledge. Allow me, as an instance of this sort, out of a many, to refer you to the works of Solomon, whose sayings are to be found in an invaluable book called the Bible.

Whether any thing which I have ventured to advance on this subject, will lead Mr. F. to change his opinion, I cannot say; but there is one argument which may be used that, to my mind, carries so much weight, that if there was no other, my views would still remain as they are.—The argument is this: that if the Almighty had seen that the end he had in view, by the creation of man, could have been answered by giving man instinct only, he would not have bestowed on him reason. The perfection of the Almighty, in all his works, forbids the idea of his having given any quality or property to man, his noblest work, which is not essential to his happiness.

Yours, A NEW SUBSCRIBER.

Barton-upon-Humber.

MR. EDITOR,

Be pleased to give the following translation a place in the Quarterly Visitor, and you will oblige, yours, &c.

HULL, October 10th, 1815.

J. DAIMOND.

The following is a literal translation of the Petition sent by the Wife of ALMAS ALI KHAN, who was lately seized upon, and put to death, for political purposes, in India.

To the High and Mighty Servant of the most powerful Prince George, King of England, the lowly and humble slave of misery, comes praying for mercy, to the Father of her Children:

Most MIGHTY SIR,

May the blessings of God ever wait on thee, may the sun of glory shine around thy head, and may the gates of plenty, honour, and happiness, be ever open unto thee, and thine.—May no sorrow distress thy day, may no grief disturb thy night, may the pillow of peace kiss thy cheek, and the pleasures of imagination attend thy dream; and, when length of years makes thee tired of earthly joys, and the curtain of death gently closes round the last sleep of human existence, may the Angels of thy God attend thy bed, and take care that the expiring lamp of life shall not receive one rude blast to hasten its extinction.

O hearken then to the voice of distress, and grant the Petition of thy servant.—Spare, O spare, the father of my children; save the partner of my bed—my husband—my all that is dear:—Consider, O Mighty Sir, that he did not become rich by iniquity; and that what he possessed was the inheritance of a long line of flourishing ancestors, who, in those smiling days, when the thunder of Great Britain was not heard on the fertile plains of Hindostan, reaped their harvest in quiet, and enjoyed their patrimony unmolested.

Think, O think, that the God whom thou worshipest, delights not in the blood of the innocent. Remember thy own commandment, “Thou shalt not kill,” and obey the orders of Heaven.

Give me back my Almas Ali Khan, and take all our wealth; strip us of our jewels, and precious stones, of our gold, and of our silver, but take not away the life of my husband.—Innocence is sealed on his brow, and the milk of human kindness plays around his heart.

Let us go and wander in the desarts, let us become the tillers and labourers in those delightful spots of which we once were Lord and Master—but spare, O spare, Mighty Sir, spare his life! Let not the instrument of death be lifted up against him—for he has committed no crime.

Accept our treasures with gratitude; thou hast them at present by force.—We will remember thee in our prayers, and forget that we were once rich and powerful.—My children, the children of Almas Ali Khan, send their Petition for the life of him who gave them life; they beseech from thee the author of their existence.

By that humanity which we have oft been told glows in the breasts of European loveliness; by the tender mercies of the enlightened Englishmen; by the honour, the virtue, and the maternal feelings of the great Queen, whose numerous offspring is so dear to her; the miserable wife of thy prisoner, beseeches thee to save her husband's life, and restore him to her arms.

Thy God will reward thee, thy country must thank thee: and she now petitioning, will ever pray for thee, if thou grantest the prayer of thy humble vassal.

TRANSLATION
OF THE INSCRIPTION ON THE COLUMN ERECTED TO THE
MEMORY OF

Dr. TOBIAS SMOLLET.

By Mr. W. PUTSEY, *Pickering.*

Stop, Traveller!
If ever thou admirest the facetiousness of men,
an affable disposition,
and a picture of manners the most circumspect,
attend a moment to the monument of
TOBIAS SMOLLET, M. D.
Let the virtues of a man, not of ordinary attainments,
excite thy admiration;

and which, in a man and a countryman,
 thou shouldst applaud and imitate :
 who being engaged in various literary pursuits,
 after he had commended himself to posterity,
 was snatched away by a painful death,
 in the 51st year of his age.

Alas ! far from his own country, he lies interred
 near Leghorn, being then in Italy.

His cousin, and such other of his relatives
 to whom it seemed most eligible to resign
 his possessions,

James Smollet, of Bonhill, commanded
 this column, merely as a monument of respect,
 with this short inscription on the issue of his life,
 to be erected on the banks of the Leven,
 the place of his nativity.

Go, and remember this, not only as a mark of respect
 to the deceased, but also as an example to
 others ; for the reward of virtue will be the
 same to all who are found worthy.

The same by Mr. ATKINSON, *Heskett.*

Stop, Traveller !

If towering flights of wit and genius,
 if elegant and accurate delineation of human character,
 excite your admiration,
 pause a moment over the memory

of TOBIAS SMOLLET, M. D.

A man conspicuously adorned
 with every accomplishment
 that we admire in the citizen and gentleman,
 and every virtue

that can elicit our applause or imitation.

Possessing a vigorous mind, expanded and improved
 with various learning,

He has, with a felicity peculiar to himself,
 delivered to posterity a memorial,
 which will be co-eval with time.

His existence was terminated
 by an alarming death, in the 51st year of his age.

His mortal relics are deposited
 near Liburnum, in Italy.

Alas ! how distant from thy native country.

To this great and illustrious man
by his cousin JAMES SMOLLET, of Bonhill,
(Though it would have been more accordant
with the course of nature,
that his deceased friend had survived
to perform for him these last funeral obsequies)

this pillar is erected,

The empty monument of affection,
on the banks of the Leven ;
inscribed with these imperfect verses,
which are as it were the first wailings
of the enascent infant.

Go now, but remember
what you have seen,
not only for the remembrance of the deceased,
but also for the example :
for, be assured, the honours which distinguished him,
will ever be the reward
of the worthy and meritorious.

This inscription was also translated by the Rev. Mr.
WRIGHT, of Haxey.

To the Editor of the QUARTERLY VISITOR.

SIR.—As many of my friends have expressed a wish to
see a translation of the following inscription, I herewith
send one, which I will thank you to insert in the Quarterly
Visitor. Yours, respectfully,

St. Andrewgate, York.

T. SMITH.

Quod sub pedibus sepultum
Et neglectum jacet
Aliquando fuit
GULIELMUS EMERSON ;
Vir
Prisciæ simplicitatis,
Summæ integritatis,
Rarissimi ingenii.

Quantus fuerit Mathematicus
 Si scripta ejus perlegeris,
 Quorsum narraret saxum?
 Si non perlegeris,
 Perlege, et Scies.
 Obiit 21^o Maij, 1782.
 Ætat. An. 81.

Juxta sepulta jacet
 ELIZABETHA Uxor,
 Quæ obiit 27^o Martii, 1784,
 Ætat. An. 76.

TRANSLATION.

That which lies under your feet buried and neglected,
 once was WILLIAM EMERSON;
 A man of primitive simplicity,
 of the greatest integrity, and of singular genius:
 If thou hast perused his writings,
 To what purpose should this stone relate,
 How eminent a Mathematician he was?
 If thou hast not perused them, do so, and thou shalt know.
 He died 21st May, 1782,
 In the 81st year of his age.
 Near him lies buried ELIZABETH his Wife,
 who died 27th March, 1784, aged 76 years.

To the Editor of the QUARTERLY VISITOR.

THE following lines, taken from *The Village Pedagogue*,
 seem so applicable to the conduct of many parents of the
 present day, that I will thank you to insert them in your
 work. B.

PERHAPS to thee the Squire may have consign'd
 His fav'rite grandson, with the strictest charge,
 "On no account correct my darling boy."
 All fear of chastisement thus done away,
 Behold this sprig of quality, in lieu
 Of conning o'er with care his lesson brief,

At ev'ry window busily employ'd,
 Domitian-like, in immolating wasps !
 Ere long, with young Domitian, comes the Squire,
 With brow contracted, making long complaints :
 " He cannot find his boy at all improv'd,
 " A boy of his quick parts, 'tis wonderful indeed!"
 Shouldst thou the truth reveal, how time was spent,
 How deaf an ear he lent to thy reproofs,
 " The fault lies all with thee, nothing more clear :
 " No easier task, than to keep boys in awe
 " And due subordination by a threat ;
 " At home his William is quite tractable,
 " And quite sufficient is a word or nod."
 No mention made of all the cherry tarts,
 The currant-jelly, or the citron cake
 Which every hour are introduc'd to bribe
 The imp to good behaviour, and restrain
 The pamper'd cockerel within due bounds.
 Thus situated, no resource is left
 Except the counsel of thy Reverend Friend,
 Whose influence may possibly obtain,
 That the young fav'rite may be given up
 Wholly to discretionary power :
 So shall the rapid progress of the boy,
 Secure to thee the grandfather's esteem !

Poetry.

ON RETIREMENT.

Let busy cits consume their time,
 In grandeur, pomp, and noise ;
 But give me, oh ! ye heavens sublime,
 Retirement's calmer joys.

Place me beside some chrystral rill,
 Whose margin 's strew'd with flowers ;
 Or place me near a verdant hill
 Where nature smiles in bowers.

And let me wander through the groves,
Where countless beauties rise;
And blooming nature's sweet alcoves
May greet my raptur'd eyes.

In lonely contemplation, there
Let me life's circle scan,
Retir'd from all the ills of war,
And all the pride of man.

From ev'ry base, inglorious deed,
Of those who're seeking fame,
Who venture life, and even bleed,
To gain a gawdy name.

But may I in an humble shed,
Have just sufficient store,
To furnish me with daily bread,
And be not rich or poor.

Then in contentment let me live,
And life's best gift enjoy;
Which man, self int'rested, can't give,
Nor cruel man destroy.

Then, oh ! indulgent heaven incline,
To grant me my request;
For if these pleasures once were mine,
I should be truly blest.

J. BAINES, jun.

ON NATURE.

O ! sacred source, and never failing spring
Of happiness; on contemplation's wing
Fair science courts investigation's light,
To shun the wrong, and triumph in the right.
An active principle is fixt in man,
The works of nature, or of God to scan.
The restless ocean waves its sandy bed;
And, rous'd by tempests, strikes the soul with dread.
Air in strong motion, or apparent rest,
Calls forth attention in the musing breast;

But *light* o'er all with dignifying rays
 Invites our notice, and commands our praise :
 Pervading all, it points to peace and rest,
 And prints immortal lessons in the breast.
 The thoughtful mind from world to world doth trace
 The greatest order, harmony, and grace.
 In pleasing mood it tastes of joys refin'd,
 Learns whence it is, and for what end design'd.
 The mind thus freed by truth shall safely roam,
 And call immensity its native home.

BENJ. FARROW.

TRANQUILLITY.

As I stood on the banks of Clyde's silvery stream,
 As peaceful and calm as the spring's placid beam,
 O'er its wide spreading bosom nor murmur or sigh,
 They were husht in the breeze, and no zephyr pass'd by :
 The waters flow'd gently away.

My breast was as tranquil, my soul as serene
 As the blue vaulted sky on a fair summer's e'en,
 In a mirror reflected by the pellucid stream :
 So is heaven in my soul, tho' it seem'd as a dream,
 A vision that vanish'd away.

H. N. GREAVES.

A CONCLUSION TO THE QUERY ON LIGHT.

SIR,—As you and I have no particular intercourse, I wish to take an excursion with you. Let us fix ourselves on the borders of the sun. Now, according to the idea that all light flows from that luminous orb, conceive the immense ocean of moveable matter to flow to the borders of the solar system ; then we fix ourselves on the confines of the solar system, and see the impossibility of the quick motion of light from it to the sun : you, with me, will conclude that light is fixed, and not moveable. Belief proves nothing ; reasonable demonstration proves facts.

HULL.

BENJ. FARROW.

Answers to Queries.

(68) *Answered by Mr. WATERLAND, Thealby.*

Of substance or matter we can certainly form a clear idea, because it can always be submitted to the observation of some of our senses ; it may be seen, felt, &c. But of spirit we can have no certain idea, being unable to bring it under the cognizance of any one of them. We cannot subject it to experience, or find any thing to compare it with, as it is totally different from every thing of which we have a knowledge. If we stretch our imagination to the utmost, to form an idea of it, still we shall find that the object of every idea which we form has some of the properties of matter. Ossian, in describing the spirits of his heroes, is obliged to give them one of the properties of matter, that is visibility ; as without that, or some other property of matter, they would not admit of a description. The term spirit can only be defined by ascribing to it all the negative qualities of matter ; such as being invisible, intangible, without parts or extension, &c. ; no positive qualities can be assigned to it ; and consequently no idea can be formed of it, because we cannot have any idea whatever of that which cannot act upon any one of our organs.

The same by Mr. BAINES, Jun. Reading.

MR. LOCKE defines an idea to be the object of perception, thought, or understanding, and this is certainly the popular meaning of the word ; but philosophers, more attentive to precision, as Berkeley, Hume, and Watson, have confined the signification of it to the representation of an image, or copy of a past sensation. Thus, when we think of or recollect the different parts of a church which we have seen, and can mentally perceive its aisles, pulpit, altar, &c. we may be said to have an idea of it. The clearness of the idea consists in its resemblance to the sensation, or aggregate of sensations of which it is the copy ; thus we have a clearer idea of a man whom we have seen, when we recollect his size, corpulence, and the features of his face, than if we recollect his stature only. Ideas are original, when they repeat, in the same connexion, order, and manner, without any inter-

tional variation, the sensations which they represent; they excite stronger emotion than fictitious ideas, or ideas of the imagination, which represent to us things that we have never seen; but which have been related to us by others. —Hence, as the idea of substance is original, it is the clearer of the two.

Also by *Messrs. Juvenis, Osmond, and Watson.*

(69) *Answered by JUVENIS, Manchester.*

A PERSON who has long been accustomed to the constant use of intoxicating liquors, may drink a considerable quantity, without perceiving any of the unpleasant effects usually produced by them; whilst one who seldom, if ever tastes them, will become inebriated by a very small portion. Upon the same principle, the narcotic quality, which tobacco possesses in a high degree, will operate strongly upon a person when beginning to smoke; but habit will diminish, and at length totally destroy its effects.

The same by Mr. WATERLAND.

THE stupefaction brought on by smoking tobacco is owing to the narcotic powers of the herb. During the act of smoking, some of the fumes of tobacco, or the saliva impregnated with them, are introduced into the stomach. There they produce their narcotic effects. They diminish the sensibility of that organ. They weaken the action and tonic powers of its muscular fibres: hence digestion is retarded. They also greatly diminish the energy of the nervous system; and hence are produced torpor and stupefaction.

Also by *Mr. Baines and Mr. Osmond.*

(70) *Answered by Mr. BAINES.*

THE propriety of omitting the letter *u* in the orthography of the words *neighbour, valour, vigour, &c.* cannot be doubted, since it is evident their pronunciation would be more agreeable to the sound of the remaining letters, and coincide better with analogy than if retained.

The same by Mr. OSMOND, Withernsea.

I AM of opinion that if the letter *u* was omitted in the word *neighbour*, we should in time be led to pronounce it too much like *barber*, *timber*, &c.; therefore, I think the present mode of spelling it is preferable to that alluded to by the proposer.

(71) *Answered by Mr. GEORGE LENG, Hull.*

THE doors and windows being shut appears to be the safer way; for, as soon as the electric fluid comes in contact with any thing that acts as a conductor, the effect of the stroke is greatly diminished, if not entirely destroyed; whereas by the doors and windows being open, the lightning may enter, in an oblique direction, and do much damage. Those who are out of doors in a thunder storm, would do well to prostrate themselves in a deep ditch or land-furrow, remote from any hedge; it is imprudent to go for shelter under a tree, or any single object.

The same by LANCASTERIUS, Beverley.

THE practice of setting open doors and windows during a thunder storm, is much upon the decline, as the bad effects it has produced, by admitting the electric fluid, have taught many the necessity of shutting it out. The reason assigned for setting them open is to give a free circulation of air, by which means, should the electric fluid enter at the door, it would have an opportunity of escaping out of the window; but the best way is to prevent its admittance by shutting the house as close as possible.

The same by JUVENIS, Manchester.

THE electric fluid cannot be prevented from entering a building, however closely the doors and windows may be shut; but if confined within a small compass, it is very probable that it would be productive of more damage, than as if a free passage were afforded it. It has been remarked, that the electric fluid, when it passes through a house, in its way to the negative earth, generally enters where it meets with the least opposition, by the chimney or window; and it has been known to enter by the

chimney, and go out directly through the window, or run round the walls of the room, when there was a bell-wire or any thing attractive, and then pass through the window. Hence it is adviseable not to sit near a window or chimney, during a thunder storm, but near the middle of a room, at a distance from the walls, and not in a direct line between the fire-place and the window.

Of nearly the same opinion is *Mr. Baines*.—*Mr. Osmond*, the proposer, also answered this query.

(72) *To this query no satisfactory answer has been received.*

(73) *Answered by Mr. WATERLAND.*

ALE, during a thunder storm, is agitated by the violent concussions or shaking of the air. This motion hastens fermentation, and the escape of carbonic acid gas; hence the ale becomes sour.

The same by Mr. STRINGER, Sheffield.

THUNDER is apt to turn ale sour by the violent agitation and new fermentation it causes in that liquor, by which its spirituous parts are in a great measure dissipated or depressed, and its tartarous parts exhaled.

The same by Mr. BAINES, Jun.

To explain this phenomenon it is only necessary to observe, that electricity or lightning is well known to quicken vegetation, and that oxygen gas, which is the cause of acidity, is a great supporter of vegetation; and it cannot be doubted that a violent thunder storm alters the constituents of the atmosphere, so as to make the quantity of oxygen gas predominate in it, and thereby cause ale or any other fermented liquor to become sour.

Also by Messrs. Juvenis and Osmond.

(74) *Answered by Mr. HUDSON, Epworth.*

THE aculei, or stings of nettles, are curious microscopic objects, very finely pointed; those of the *Urtica urins* are hollow, having an aperture at the point, through which the acrimonious liquor contained in a bag at their base is insinuated into the wounds, made by the stings perforat-

ing the skin, which they readily do when pressed upon. Those of the *Urtica dioica*, or common nettle, have a bladder at their base, also filled with a burning corrosive liquor. When the stings are touched, they excite blisters, attended with a violent itching pain ; and though they do not appear tubular or perforated, like the former ; nor is there any visible liquor infused into the punctures made by them in the flesh ; yet it appears certain that some of this liquor is insinuated into the wound, as the stings of the dried plants excite no pain.

(75) *Answered by Mr. Noorthen, Jun. Optician.*

THE effects mentioned in the query are observable only when polished iron is heated, and probably depend on the different degrees of oxidation. In tempering articles of steel, it has been long observed that they experience a regular successive change of colour, according to the increase of heat to which they are exposed. Between 430° and 450° , a pale yellow tinge is perceptible ; at 460° , a straw-yellow colour ; and gradually deeper as the heat is increased ; by farther augmentation, the surface is successively brown, red, and purple ; and at length it becomes a deep blue, similar to that of watch springs. The reason of these curious and wonderful changes is usually ascribed to the combination of oxygen with the surface of the metal. Sir Humphrey Davy was disposed to doubt the truth of this solution ; but upon accurate investigation, he found it correct.

The same by Mr. BAINES, Jun.

THE appearance of various ranges of prismatic colours, on the polished surface of a piece of iron, which takes place long before ignition, must undoubtedly be attributed to oxidization, the stratum of oxid being the thickest where the heat has been the greatest, and gradually thinner towards the colder part ; this is evident, because the red of each order of colours is always the nearest to that end which has been most heated.

The same by Mr. WATERLAND.

THE changes of colour on the surface of iron, when heated, are owing to its different degrees of oxidation, as the temperature of the iron increases, its affinity for

oxygen increases also. The first degree of oxidation, or when the iron is slightly heated, is yellowish white; the second, or when at a higher temperature, is yellow; the third, gold colour; the fourth, purple, &c. A bar of clean white iron or steel may be made to assume all the above colours at once, by placing one end in the fire, and keeping the other out, which is supposed to be of a sufficient length to remain cold.

Also by *Messrs. G. Leng and Osmond.*



Answers to Mathematical Problems.

(119) *Answered by Mr. HINE, Serjeant, 2d Royal Lancashire Militia.*

ON $AB = 68$ = dist. of the North and South ports, describe a segment of a circle to contain an L of 18° ; find the centre S , through which, parallel to AB , draw the diam. GP ; join AP , BP , and draw a tangent, at P , to cut the prolongation of BA in D : then P is the port sailed to; BP , AP , are the distances; BD , AD , the diff. of latitude; the angles B and PAD the courses.



Dem. The circle $ABGP$ is the locus in which are situated all the ports that might be sailed to, whose distances would make an L of 18° ; and PD is perp. to the merid. BD . But when P is the extreme point of a Diam. parallel to AB , AD , BD , are obviously the greatest.—The rest is very manifest.

Calculation. Make $SC \perp AB$, join SA . In $\triangle ASC$, $AC = 34$, and $\angle CSA = BPA = 18^\circ$ (Eu. 3 B. P. 20); $\therefore SC = PD = 104.65$. Again $\angle B = \frac{1}{2} PSA$ (ibid.); and $\angle PSC (90^\circ) - CSA (18^\circ) = PSA (72^\circ)$: hence $\angle B = 36^\circ$; therefore in $\triangle BPA$ all the angles and AB are given to find $BP = 178$, $AP = 129.34$; lastly, are readily found $AD = 76.03$, and $BD = 144.03$.

Also by *Messrs. Baines, Lamplugh, Leng, Mair, Page, Wilkinson, Wiseman, and Yorke.*

(120) *Answered by Mr. HINE.*

WHEN the earth is considered as an ellipsoid, the centrifugal force in receding from the line diminishes, as the square of the cosine of the latitude directly.

We have the centrifugal force at the line = $\frac{1}{289}$ of gravity, and the cos. of $53^\circ 45'$ = .59131; therefore Rad. (1) : .59131² :: $\frac{1}{289}$ ∴ .001209853 the centrifugal force at Hull, and this must be added to the man's weight, when the rotation of the earth ceases: he is therefore heavier than before.

Cor. Because, at the pole, the cosine of lat. is nothing, the centrifugal force is also nothing; and whether the earth be in motion or at rest, bodies have there the same weight.

The same by Mr. WISEMAN, Hull.

LET the abstract gravity at the equator be denoted by unity; then, vide Simpson's Fluxions, art. 217, $1 - \frac{1}{289} = \frac{288}{289}$ will be the gravity as affected by the centrifugal force; and *ibid* art. 400, taking the ratio of the axis to the equatorial diameter as 230 to 231; $230 : 231 :: \frac{288}{289} : 231 \times 288 \div 230 \times 289$ = the gravitation at the pole. But, *ibid* art. 401, the gravitation increases as the square of the sine of the latitude nearly; therefore, putting s = sine of latitude, $1^2 : s^2 :: 231 \times 288 \div 230 \times 289 - 288 \div 289 = 288 \div 230 \times 289 : 288 s^2 \div 230 \times 289$, and $288 \div 289 + 288 s^2 \div 230 \times 289 = (1 + s^2 \div 230) \times 288 \div 289$ = the gravitation in the given latitude. Now the centrifugal force in different circles, revolving in the same time, being as the radii of those circles, this force in the par. of the given latitude may be easily calculated in the spheroid; and, resolved into a force, perpendicular to the horizon, will be proportional to the inc. of wt. but the diff. between this and the similar force in the sphere, (where it is as the square of the cosine of latitude) being hardly sensible; theref. (putting c = cos. of lat.) $1^2 : c^2 :: 1 \div 289 : c^2 \div 289$; and $(1 + s^2 \div 230) \times 288 \div 289 : (1 + s^2 \div 230) \times 288 \div 289 + s^2 \div 289 :: 12 : 12 + 115 c^2 \div (230 + s^2) \times 12 = 12.0145275 = 12$ stone $3\frac{1}{4}$ oz., the increase of weight will therefore be $3\frac{1}{4}$ oz.

Also by Messrs. Lamplugh, Mair, and Yorke.

(121) Answered by Mr. BAINES, Jun. Reading.

FIRST $308\text{ £. }6\text{s. }8\text{d.} - 8\text{ £. }6\text{s. }8\text{d.} = 300\text{ £.}$ the present worth of the two notes. Put x and $300 - x$ = the present worths of the two notes, and y = the interest of 1 £. per cent. per annum; then $\frac{xy}{2}$ = the interest of the 1st, and $(600y - 2xy) \div 3$ = the interest of the 2d note: hence $xy \div 2 + (600y - 2xy) \div 3 = 8\text{ £. }6\text{s. }8\text{d.} = 25 \div 3\text{ £.}$, or $x = (1200y - 50) \div y$; but $\left(\frac{xy}{2} + x\right) \times \frac{y}{2} = \frac{2xy + xy^2}{4}$ = the interest of the amount of the 1st note; and $\frac{2y}{3} \times \left(300 - x + \frac{600y - 2xy}{3}\right) = (1800y - 6xy + 1200y^2 - 4xy^2) \div 9$ = ditto of the 2nd. Theref. $\frac{2xy + xy^2}{4} + \frac{1800y - 6xy + 1200y^2 - 4xy^2}{9} - \frac{xy}{2} - \frac{600y - 2xy}{3} = \frac{17}{72}\text{ £.}$, or $\frac{9600y^2 - 17}{14y^2} = x$; hence $\frac{9600y^2 - 17}{14y^2} = \frac{1200y - 50}{y}$, or $y^2 - \frac{7}{72}y = -\frac{17}{7200}$; $\therefore y = \frac{1}{20} = 5\text{ £.}$ percent. per ann. the rate. Moreover $x = \left(1200 \times \frac{1}{20} - 50\right) \div \frac{1}{20} = 200\text{ £.}$ the present worth of one note; hence 100 £. the present worth of the other, and the notes themselves are 205 £. and $103\text{ £. }6\text{s. }8\text{d.}$ as required.

Also by Messrs. Chapman, Hudson, Jackson, Lunplugh, Mair, Settle, Simpson, Watson, and Yorke.

(122) Answered by Mr. COLLINS, Newark; Mr. DAIMOND, Hull; and Mr. WEST, Westwood-side, near Gainsborough.

LET x = side of the cube; then, per problem, $x + 1^3 - x^3 = 1000$, or $x^2 + x = 333$; hence x is found = 17.7551.

Also by *Messrs. Chapman, jun., Ford, R. F-d, Gibson, Hudson, Jackson, Killingbeck, Lamplugh, G. Leng, Mair, Postlethwaile, Settle, Smith, Stringer, Tadman, Tindall, Watson, Wiseman, Wright, and Yorke.*

(123) *Answered by Mr. WISEMAN.*

By problem $AD : DE :: 9 : 4$, and $ED : DC :: AB : AC :: 13 : 14 :: 4 : 4 \times 14 \div 13$; therefore ex aequali $AD : DC :: 9 : 4 \times 14 \div 13$; and by compos. $AD + DC : DC :: 9 + 4 \times 14 \div 13 : 4 \times 14 \div 13$; whence DC is given $= 4 \times 14 \times 14 \div (9 \times 13 + 4 \times 14)$; and $AC : AB$ or $14 : 13 :: 4 \times 14 \times 14 \div (9 \times 13 + 4 \times 14) : 4.208 :: DE$ as required.

The same by Mr. SMITH, St. Andrewgate, York.

PUT $DE = x$; then, by sim. triangles $AB (13) : AC (14) :: DE (x) : 14 x \div 13 = CD$; $AC - CD = AD = 14 - 14 x \div 13$. Now, by the problem, $4 : 9 :: x : 14 - 14 x \div 13$; whence $x = 4.208$.

Also by *Messrs. Baines, Burdon, Chapman, Collins, Daimond, Ford, R. F-d, Hine, Hudson, Killingbeck, Lamplugh, G. Leng, Mair, Settle, Simpson, Tadman, Tindall, Watson, West, Wright, and Yorke.*

(124) *Answered by Mr. KILLINGBECK, Barton-le-Willows.*

PUT $4x^3 + x$ and $4x^3 - x$ for the required numbers; then their sum is $8x^3$, and their difference $2x$. The former expression is evidently a cube; therefore it remains only to make $2x$ a cube, which suppose $= n^3$; hence $x = n^3 + 2$; taking $n = 2$, the numbers are 260 and 252. Other answers might be found by taking n any multiple of 2.

The same by Mr. PUTSEY, Pickering.

LET $ax^2 - 4$ and $ax^2 + 4$ be the two numbers, whose difference $= 8$, is a cube; and assume their sum, which is $2ax^2 = x^3$, and $x = 2a$, where a must be greater than 1. If $a = 2$; then $x = 4$, and the numbers 28 and 36.

Also by *Messrs. Baines, Burdon, Chapman, England, Ford, Hudson, Jackson, Lamplugh, Mair, Settle, Smith, Watson, Wiseman, and Yorke.*

(125) *Answered by Mr. G. LENG, Hull; and Mr. MAIR, Barton.*

THE expression is a *maximum*, when x , or $\frac{1}{x} \times \log. x$ is a *maximum*. In fluxions $\frac{\dot{x} - \dot{x} \log. x}{x^2} = 0$; therefore $\log.$

$x = 1$, and $x = 2.718$. Again, putting $y = x$; thence y is known to be a *minimum*, when the hyp. $\log. y = -1$, or $y = .36768$.

Also by *Messrs. Baines, Jackson, Lamplugh, Settle, Wiseman, and Yorke.*

(126) *Answered by Mr. YORKE, Guisbro'; and Mr. TINDALL, Hull.*

By reduction $x^2 - 5x = 12 + 8\sqrt{x}$; to each side of this eq. add $x + 4$, and there result $x^2 - 4x + 4 = x + 8\sqrt{x} + 16$, two perfect squares; the square root of which $x - 2 = \sqrt{x + 4}$, or $x - \sqrt{x} = 6$, a quadratic; whence $x = 9$.

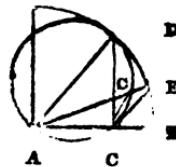
Also by *Messrs. Baines, Burdon, Chapman, jun., Daimond, Ford, Gibson, Hudson, Jackson, Killingbeck, Lamplugh, G. Leng, Mair, Settle, Smith, Watson, West, and Wiseman.*

(127) *Answered by Mr. BURDON, Acaster Malbis.*

LET C be any given point in the radius; erect the perp. CD, cutting the circle in D, the required point.

Demonstration. Join AD, on which, as a diameter, scribe a circle, cutting AB (Eu. III. 31.) in C; take any point E in the quadrantial arc; join AE, CE, and CG; then (Eu. III. 21.) the $\angle ADC = \angle AGC$; but (Eu. I. 21.) the $\angle AGC$ is greater than the $\angle AEC$; therefore the $\angle ADC$ is greater than the $\angle AEC$. Q. E. D.

Also by *Messrs. Baines, Chapman, Ford, R. F—d, Gibson, Hine, Killingbeck, Lamplugh, Mair, Putsey, Settle, Smith, Wiseman, and Yorke.*



(128) *Answered by Mr. W. SETTLE, Holbeck.*

LET $3x$ and $5x$ represent the two numbers, the difference of their squares is well known to be a square; and we have only to make the difference of their cubes a square, or $125x^3 - 27x^3 = 98x^3$ a square $= n^2 x^4$; then $x = 98 \div n^2$; where n may be taken at pleasure. If $n = 1$, then $x = 98$, and the two numbers which will answer the conditions of the problem are 294 and 490.

The same by Mr. FORD, Burton-Pidsea.

PUT $5x$ and $4x$ for the two numbers; then $25x^2 - 16x^2 = 9x^2$ a square. It therefore only remains to make the difference of their cubes, viz. $61x^3$ a square, say $= (nx)^2$; $\therefore x = n^2 \div 61$. If n be taken $= 61$, the numbers become 305 and 244, which answer the question.

Also by *Messrs. Baines, Burdon, England, Hudson, Jackson, Killingbeck, Lamplugh, Smith, Putsey, Watson, and Yorke.*

(129) *Answered by the Rev. W. Waight, Hazey; Mr. Hudson, Epworth; and Mr. Jackson, London.*

PUT x = the thickness, and x^2 = the inner diam. of the ring, and p = 9.8696. Then $(x + x^2) \times p \times x^2 \div 4 = 789.568$, and $x^3 + x^4 = 320$; hence $x = 4$, and $x^2 = 16$.

Also by *Messrs. Baines, Collins, Daimond, Ford, R. F-d, Hine, Killingbeck, Lamplugh, G. Leng, Mair, Poslethwaite, Settle, Simpson, Tadman, Watson, West, Wiseman, and Yorke.*

(130) *Answered by Mr. Lamplugh, Kilham; and Mr. Thomas Wetherill, Guisbro'.*

A's share $= 576 \div 24 \times 2 = 12$ acres, and B's share $= 576 \div 36 \times 2 = 8$ acres; therefore 8 plus 12 = 20 acres = 200 sq. chains, the area of the triangular field; then $200 \times 2 \div 25 = 16$ chains, the perpendicular of the triangle; and 16^2 plus 11^2 = square of shorter side. Now, by similar triangles, 20 acres : 16^2 plus 11^2 :: 12 acres : 226.2 ; therefore $\sqrt{226.2} = 15.04$ chains, the distance of the point required from the vertex. Again, 20 acres : 25^2 :: 12 acres : 375; $\therefore \sqrt{375} = 19.3649$ chains the length of the dividing line.

Also by *Messrs. Baines, Daimond, Ford, R. F—d, Hine, Hudson, G. Leng, Mair, Settle, Simpson, Tindall, Watson, West, Wiseman, Wright, and Yorke.*

(131) *Answered by Mr. ROB. LAW.*

If $a + y^2 = z^2$; then $z^2 - y^2 = a$; and if a be a prime we can only resolve it into the factors 1 and a , we must have therefore $z + y = a$, and $z - y = 1$; consequently $y = (a - 1) \div 2$; yet if a is not prime, but $a = bc$; then in the same way we find $y = (b - c) \div 2$; hence y in this case is less than in the former. If, therefore, when z is a minimum, $y = (a - 1) \div 2$, a is a prime; but if less than $(a - 1) \div 2$, the number is composite. Q. E. D.

The same by Mr. Settle, Holbeck.

I do not perfectly understand Mr. Barlow in this question: for if we take $a = 3$, which is evidently a prime number; then y must equal 4, to make the sum of their squares a square, which is evidently the only whole square number that can be obtained, when a remains constant; therefore, he might as well have said a *maximum* as a *minimum*.

Mr. MAIR, of Barton, favoured us with a solution to this problem.

(132) *Answered by Mr. YORKE, Mr. R. F—d, and the Rev. W. WRIGHT.*

LET D = the greater diam. of the frustum, d = the less, l = the length, and $c = .7854$. Now, by the common method of reducing to a cylinder, $\frac{D + d}{2}^2 \times cl$ = the solidity; and $\frac{D^3 - d^3}{D - d} \times \frac{cl}{3} = \frac{D^2 + Dd + d^2}{3} \times cl$ = the true solidity; from which take $\frac{D + d}{2}^2 \times cl$, and there remains $\frac{D - d}{12}^2 \times cl$, the error in defect universally.

Also by *Messrs. Baines, Chapman, Daimond, Hine, Hudson, Lampugh, G. Leng, Mair, Settle, and Wiseman.*

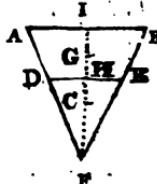
(133) Answered by Mr. BAINES, Jun.; and, in a similar manner,
by Mr. ENGLAND.

LET ABF be the given triangle immersed in the fluid, the side AB coinciding with the surface, DE the line of division, G the centre of gravity of the trapezoid, ABED, and C, that of the triangle DEF. Put $AB = a$, $FI = b$, and $HF = x$; then $HI = b - x$, and, by similar triangles, $b : a :: x : a x + b = DE$; by art. 655, Marrat's Mechanics, $(b - x) : 3 \times (a x + 2 ab) : (ax + ab) = GH$; hence $GI = (b^2 + bx - 2x^2) : 3 \cdot (x + b)$, which is as the dist. of the centre of gravity of the trapezoid from the surface, and $CI = (3d - 2x) : 3$, is as that of the triangle; but $\frac{ab + ax}{b} \times \frac{b - x}{2}$ and $\frac{ax^2}{2b}$ are as the areas of the trapezoid and triangle; wherefore in case of an equal pressure, $\frac{b^2 + bx - 2x^2}{3 \cdot (x + b)} \times \frac{ab + ax}{b} \times \frac{b - x}{2} = \frac{3b - 2x}{3} \times \frac{ax^2}{2b}$, or $4x^3 - 6bx^2 + b^3 = 0$; hence $x = \frac{1}{2}b$, from which the position of the line is determined.

Also by Messrs. Lamplugh, Settle, Watson, Wiseman, and Yorke.

(134) Answered by Mr. BURDON, Acaster Malbis.

PUT $AB = a$, $AP = x$, and $PL = y$; then $\overline{a - x} \times \frac{x}{a} = y$. The fluxion of the area $APL = yx = \overline{a - x} \cdot \frac{xx}{a}$, the fluent of which is $\frac{x^2}{2} - \frac{x^3}{3a}$; which (when $x = a$) becomes $\frac{a^2}{6}$, the area of the curve ALB. Again, putting $p = 3.1416$, the fluxion of the solid $= p y^2 x = \overline{a - x} \cdot \frac{x^2}{a} \cdot p \frac{x}{a}$, the



uent of this is $\left(\frac{x^3}{5a^3} - \frac{x}{2a} + \frac{1}{3}\right) \cdot px^3$, which, when $x=a$, gives $\frac{a^3 p}{30}$, the content of the solid generated by the curve about AB.

The same by Mr. WISEMAN, Hull.

LET $x = AP$, $y = PL$, and $a = AB$; then, per prob.
 $= \frac{x \times a - x}{a}$, the equation of the curve. Next, $\frac{x \times a - x}{a}$
 \dot{x} , is the fluxion of the area APL; whence the area
 $\frac{ax - 2x^3}{6a} = (\text{when } x=a) \frac{a^3}{6}$. Again, put $p = .7854$;
then $\dot{x} \times p \times \left(\frac{2x \times a - x}{a}\right)^2 = 4p x^2 \dot{x} - \frac{8p x^3 \dot{x}}{a} +$
 $\frac{p x^4 \dot{x}}$ the fluxion of the solid; the fluent whereof =
 $p x^3 - \frac{2p x^4}{a} + \frac{4p x^5}{5a^2} = (\text{when } x=a) \frac{2p a^3}{15}$ = the con-
tent of the required solid.

Also by *Messrs. Baines, Lamplugh, Mair, Settle, & Yorke.*

(185) *Answered by Mr. WEST, Westwood-side, near Gainsbro'.*
PUT $a = 16\frac{1}{2}$ feet, $b = 7\frac{1}{2}$ seconds, $c = 1142$ feet, and
= the depth of the pit; then $\sqrt{x \div a}$ = the time of the
one's falling, and $x \div c$ = that of the sound's returning.
Now, $\sqrt{x \div a} + x \div c = b$, per problem; which reduced
gives $x = 727\frac{1}{2}$ feet nearly. Since the power of gravity
decreases below the earth's surface, in proportion to the
distance from the centre; therefore, let $p = 20899058\frac{1}{2}$
= the earth's radius; then, as $p : 400\text{lbs.} :: p - x : 99.986075932\text{ lbs.}$ = the weight of the corp at the
bottom of the pit; consequently, the difference of weight
= $8\frac{1}{2}$ drams.

Also by *Messrs. R. F-d, Hudson, Lamplugh, G. Leng,
Mair, Settle, Wiseman, Wright, and Yorke.*

Review.

(Concluded from page 96, Vol. II.)

THIS work contains nearly the whole of pure Algebra; and we have, in the course of our teaching, found it exceedingly useful; though, at different times, we have expressed a wish that Mr. B. would add the application of Algebra to Geometry, &c.

Thinking so favourably of the author's little work, it may be conceived with what avidity we should seize his larger production, avowedly containing the *Practice* and *Theory* of this branch of science. We read the title page:—proceeded, and found the work dedicated to the Prince Regent.—Our expectations were considerably augmented. We then turned to the Introduction—a History of Algebra. Not many pages were perused, before we perceived that it was only Dr. Hutton's extensive labours, on that subject, to use a printer's term, *cut down*. Different people use different stimuli. We, when flagging, occasionally take down Dr. Hutton's Dictionary, or New Tracts, and dose over his narrations of the labours of Diophantus, Xylander, &c. By so doing we rise dilated and refreshed: this accounts for our readiness in tracing the source whence Mr. B. obtained his materials.

The arrangement of the first volume of this Treatise differs very little from that of the *Introduction to Algebra*. The first seventy-six pages contain *Definitions*, *Examples of Algebraic expressions*, *Addition*, *Subtraction*, *Multiplication*, *Division*, *Algebraic Fractions*, *Involution*, *Evolution*, and *Irrational Quantities, or Surds*. Mr. B. has answered two or three of the leading examples in each rule; but the remaining, and most material examples, are left even without the results of the operations, which we think subtracts considerably from the merits of the publication.

Had the author announced an intention to publish a Key, our objections would have been obviated; but we have seen no intimation of the kind. No mathematical teacher is ignorant that youths sometimes make their

processes bend to the results ; yet frequently the tutor wants a criterion, particularly if he has many pupils to engage his attention.

We have carefully worked these examples over, and shall point out such typographical errors in the enunciations as have occurred, and are not noticed in the *Errata*.

At page 33, are the following examples for reducing a fractional expression to its lowest terms :—

It is required to reduce $\frac{48x^3 \text{ plus } 16x^2 - 15}{24x^3 - 22x^2 + 17x - 5}$ to its lowest terms.

It is required to reduce $\frac{9x^5 - x^3 - 4x^2 \text{ plus } 1}{15x^4 - 2x^3 - 13x^2 - 2x \text{ plus } 2}$ to its lowest terms.

To reduce each of these examples to its lowest term we have more than once attempted, but have as often failed, as have also some of our friends. This is one proof of the impropriety of omitting results.—Books that are written for the use of schools, or students, should be rendered as free from difficulties as possible.

The section on *Irrational Quantities, or Surds*, is done in a masterly manner, and exceeds most of the works we have seen on the subject. The examples are numerous and well selected, and the rules drawn up in Mr. B.'s lucid way ; but we have again to complain of the want of results. At page 60, for $\sqrt{108}$, read $\sqrt{128}$.

The section on *Imaginary Quantities* follows that of *Surds*, and is also well executed. To each example is affixed the result ; which is the case with all the remaining examples in each section ; which, in our opinion, renders this part of the work far more instructive.

Arithmetical and Geometrical Proportion are nearly the same as in the Introduction on the subject: the examples in *Arithmetical Proportion* are the same ; but in *Geometrical* there is an additional one ; which is the same as the 4th Ex. page 196, Ed. 10. in the author's *Arithmetic*.

Simple Equations. The rules here are similar to those in the Introduction. The number of examples for Practice of the resolution of simple equations, containing only one unknown quantity, is twenty-two. In the enunciation of

the 8th plus \sqrt{x} should be $-\sqrt{x}$; and the answer to the 20th should be $1 - \frac{1}{4a}$. In the *examples for Practice of the resolution of simple equations, containing two unknown quantities*, of which the number is ten, the answer to the 9th should be $x = \frac{a + \sqrt{2b - a^2}}{2}$, and $y = \frac{a - \sqrt{2b - a^2}}{2}$.

The resolution of simple equations, containing *three unknown quantities*: this is in a great measure the same as in the Introduction.

Questions for Practice, producing simple equations: the number is forty-two, twenty-one of which are in the author's first work. Having seen several publications on the subject of Algebra, we are sorry to remark that many of the questions are hackneyed: A servant agreed to live with his master for £8 a year, &c.; A person bought a chaise, horse, and harness, &c.; A person has two horses and a saddle, &c.; A hare is 50 leaps, &c.; A man and his wife usually drank out a barrel of beer, &c.; with several others; and we fear the fish-question is too stale to be served up to suit the taste of any one. We cannot help remarking, that we think Mr. B. has been negligent respecting this department of his work; as we are convinced that no man is better qualified to furnish a new set of questions than he.

Quadratic Equations. The number of *Examples for Practice* is 17: the answer to the 15th should be $\frac{1}{2}$ plus $\frac{1}{2}\sqrt{41}$, not $\frac{1}{2}$ plus $\frac{1}{2}\sqrt{33}$. *Questions for Practice*, producing quadratic equations, are twenty-six; thirteen of which are also in the author's other work. The 15th has excited some curiosity, and raised disputes amongst several minor mathematicians. It is as follows:—The difference of two numbers is 8, and the difference of their fourth powers is 14560; required the numbers. This problem was ingeniously answered by Mr. Lamplugh, of Kilham, in the work which roused him to the study of the mathematics (the *Quarterly Visitor*, page 88, vol. 2.) To the common method of solving quadratic equations, Mr. B. has added that by the tables of sines and tangents, which we consider an improvement.

Then follow the various methods of solving *Cubic Equations*, *Biquadratic Equations*, *Equations by Approximation*, *Reciprocal Equations*, *Binomial Equations*, *Equations that have equal Roots*, and *Exponential Equations*.—In drawing up the respective rules of each section, the author has displayed, according to our opinion, great skill and judgment. Page 163, Ex. 7, $x = -5.11175$, &c. Page 169, in the enunciation of Ex. 6, for 132 read 123. Page 193, enunciation Ex. 4, for $46x$ read $48x$. These, we believe, are the only typographical errors in the above sections, save the final figure in a few answers is a unit too much.

Binomial Theorem. Here nothing new can be expected, as the subject has engaged the attention of most mathematicians since its discovery, by the immortal Newton, in 1669. The examples worked at length by Mr. B. are perspicuously done, and we advise all students to follow his method. To illustrate this rule, the author has furnished a choice collection of examples, and the answers we believe have very few typographical errors. We are sorry that an unexpected event has frustrated our intention of working over every question in the book. Our thoughts have been engrossed by an unprovoked and malevolent attack upon our integrity and learning; but as soon as the storm has subsided, and leisure will permit, we will again turn our attention to it.

Next follow the *Multiplication and Division of Series*, the *Multinomial Theorem*, the *Method of Indeterminate Coefficients*, and the *Reversion of Series*: amongst the examples we recognise some of Emerson's; but, upon the whole, the author deserves the thanks of the Algebraist, for what he has here done and collected.

Vanishing Fractions, and *Figurate and Polygonal Numbers*, following the preceding, are largely insisted on.

The Indeterminate Analysis: this department is divided into three problems: the first contains twenty-five examples (the answer to the 20th, should be 37 ways, and the amount 12987*£.*); the second eleven. The eleventh, or last, is rendered ambiguous by an attempt at elucidation. It is as follows: it is required to determine in what year of Christ the cycle of the sun was 8, the cycle of the moon 10, and the cycle of induction 10.

or which is the same thing, to find the least whole number, that, being severally divided by 28, 19, and 15, shall leave the remainders 8, 10, and 10; the whole of these periods or cycles being 28, 19, and 15 years respectively. Now the answer to the first member of this sentence is 1567; but to the second 6280. The third problem, *Compound intermediate Equations*, contains eight examples. In answer to the 5th ex. for 19, read 9; and to the 8th, for 190, read 290.

Diophantine Analysis. In treating on this branch of Algebra, Mr. B. has formed a most valuable set of rules; and we cannot detail the merits of his labours better than in his own words: "The subject here treated on, which forms one of the most curious and abstruse branches of the Intermediate Analysis, has been amply investigated and exemplified, both by Diophantus and several modern writers on Algebra, whose works abound with inquiries of this nature; but as some of the most valuable of these performances have now become extremely scarce, and others are too voluminous to be brought into general use, it is hoped that the following methodical abstract of this part of the science, which comprehends most of the methods hitherto known, for resolving problems of this kind, will be found acceptable to such readers, as may wish, by means of a ready compendium, to acquire some knowledge of this interesting branch of the Analytic art."

The student will find twenty-eight examples worked out, to elucidate the rules in a clear manner. Those for practice are twenty-four, and well chosen.

After these come *Continued Fractions*, *Decomposition of Fractions*, *Recurring Series*, *Summation of Infinite Series*, *Logarithms*, *Multiplication*, &c. by *Logarithms*, *Most useful Forms of Series*, and *Miscellaneous Questions*, eighty-seven in number. The different branches here specified, we recommend to the attentive perusal of the reader.

The second volume principally consists of the Theoretical part of the subject. To the establishing of the Leading Rules of the science, Mr. B. has devoted nearly twenty-six pages. Arithmetical and Geometrical Proportion and Progression follow; after which the Doctrine of Equations. To every person who desires to be more than superficially

conversant with Algebra, we recommend a reiterated perusal of those pages of the volume from 38 to 160 inclusive; this being a valuable part of the publication. The reader has only to refer to our enumeration of the contents of the first volume to make himself acquainted with those things which are proved in the second. We can assure him that a studied attention to this volume will amply compensate the trouble he may undergo.

Appendix. This contains *Application of Algebra to Geometry*, *Application of Algebra to the Doctrine of Curves*, *the Right Line*, *the Circle*, *the Ellipse*, *the Hyperbola*, *the Parabola*, *the Conchoid*, *the Cissoid*, *the Quadratrix*, *the Cycloid*, *the Logarithmic Curve*, *the Spiral of Archimedes*, *the Logarithmic Spiral*, *the Hyperbolic, or Reciprocal Spiral*, and *the Description of Curves from their Equations*. Though these subjects have been amply treated on by others, yet we wish to remark, that there is something novel and perspicuous in the method adopted by the author—who adds, “having thus given a brief abstract of such parts of this doctrine as seemed best calculated to attract the attention of learners, I can here enter no farther into the subject, than barely to lay before the reader a few particulars relating to the characters, properties, and species of lines of the third order, as treated of by Newton, in his celebrated treatise, entitled *Enumeratio Linearum tertii Ordinis*, first published, at the end of his *Optics*, in 1706.”

CONCLUSION.

“TIME,” which puts an end to all human pleasures and sorrows, has concluded the labours of the *Editor of the Quarterly Visitor*.

In commencing the publication, I yielded to the earnest solicitations of my friends; and having always been interested in scientific pursuits, and anxious for the dissemination of useful learning, I entered upon the

undertaking, with avidity and cheerfulness: but the second Number no sooner appeared, than a misunderstanding arose amongst some of the proprietors, which had nearly given a death-blow to the work. However, to verify what had been advanced in the *Prospectus*, and to rescue my own character from disgrace, I formed a resolution to disregard any petulant bickerings, and to continue the publication.

As two volumes are now completed, and as I have passed the meridian of life, and the state of my health is greatly declining, I trust the public will not deem me capricious in withdrawing from the labours attendant on a periodical publication; and that those who have been my constant friends, will approve of such a determination, when they reflect that I have gratuitously spent nearly all the leisure hours of my time in endeavouring to rouse in the minds of men a desire to understand *pure* and *mixed* mathematics—acquirements which calm the passions, restrain the impetuosity of imagination, and free the mind from error and prejudice.

But these, my favourite pursuits, occupied only a small portion of each Number of this work.—I have studiously avoided devoting too much space to disquisitions of this kind, lest those unacquainted with them, should raise a clamour against me, and propagate the idea that the work was purely mathematical. Nay, to circumvent such a suggestion, I have, at times, curtailed the solutions more than I should otherwise have done; and I have endeavoured to make the miscellaneous part as entertaining and instructive as circumstances would permit. For this purpose, I solicited the contributions of all my literary

friends, who came forward with a promptitude scarcely to be expected, for which I sincerely thank them; though I have not always verified that, as occasionally their communications have stood over, to make room for the effusions of those more anxious to be noticed.

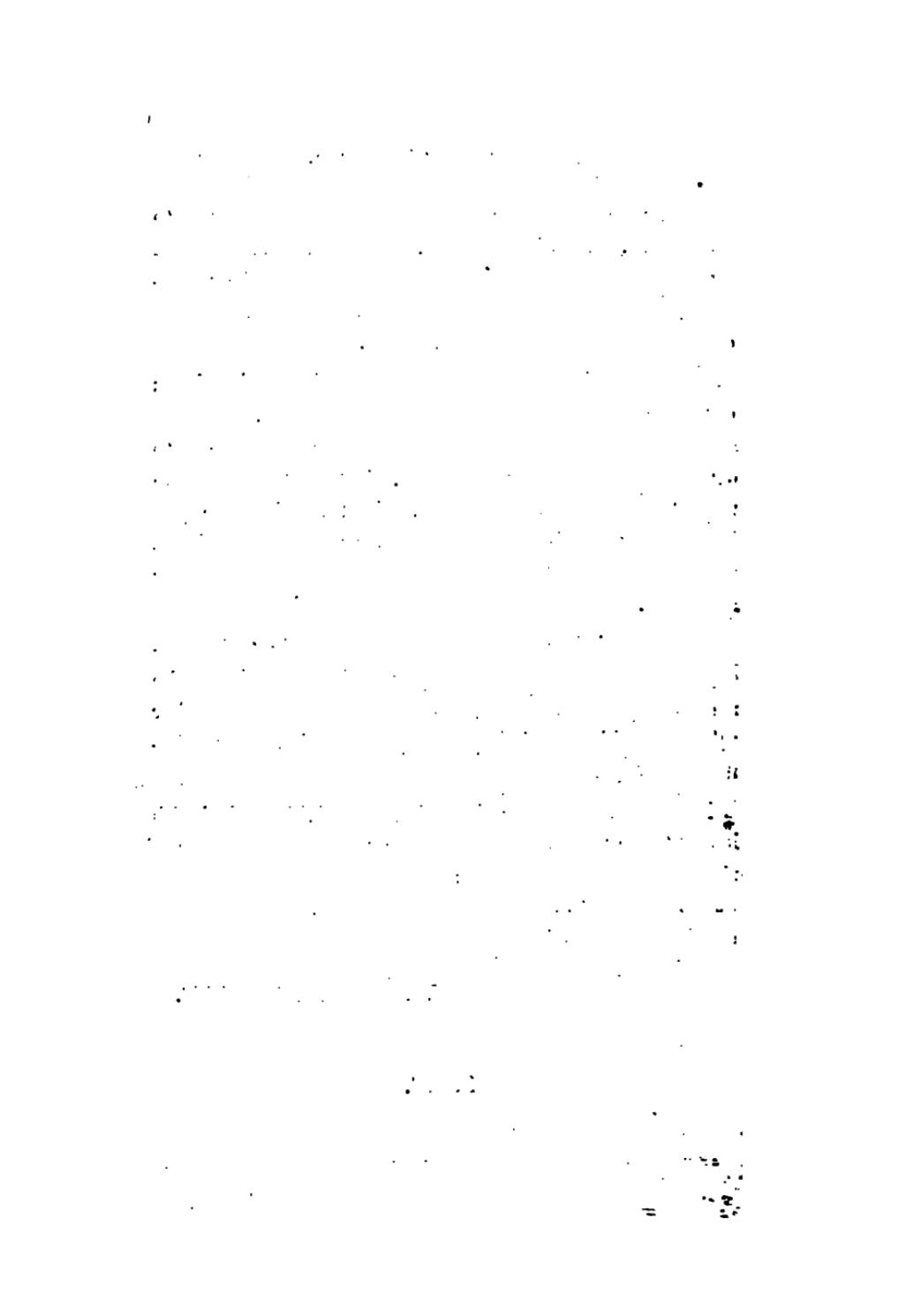
Some have been grateful for the attention paid to them; others have behaved captiously, threatening, unless I should publish a greater portion of their contributions, to desist from even taking the work. Yet whatever any one may think, it has been my study throughout to pay impartial attention to all the Contributors, and I doubt not but reflection will convince them of the truth of my assertion.

Although it is not my intention ever again to be concerned in a similar undertaking, yet should my health be reinstated, I shall not abandon my studies; but may usher to the world a testimony of my veneration for mathematical learning.

Notwithstanding the discontinuance of this work, I wish it not to be understood that I am taking a final leave of my corresponding friends: I shall always be happy to hear from them, and will, with pleasure, render them any service that lies in my power.

WILLIAM PASSMAN.

FINIS.



THE
QUARTERLY VISITOR.

"Defecando pariterque monendo."

Horace.

No. I. SEPTEMBER, 1814. VOL. II.

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ACKNOWLEDGMENTS, &c.

The Editor and Proprietors of the Quarterly Visitor with pleasure lay before the public the first number of a second volume of their publication.—As the community is composed of men whose natural bias, education, and habits, have rendered their tempers and inclinations essentially different—so to give pleasure to all, cannot be the attribute of one; but demands the united efforts of many. To accomplish this, they continue to be happily assisted by the correspondence of several learned individuals; whose anxiety for the extension of learning seems to keep pace with their own.

We are sorry that so many of our friends should be repeatedly disappointed in receiving regularly their copies of the Q. V. They have always been sent from Hull, to reach London a day or two previously to that of publication. However, in future, it is our intention to have the work in London a week before that time; and we will thank our friends to send their communications as early as possible, that we may not be impeded in putting our design into execution. This number will be sent from Hull the 27th of August, therefore it will reach London on the 22d. Should any disappointment take place, we shall be happy to be informed thereof, and we will assist in discovering the cause.

Whilst writing our acknowledgments for No. VI, we had not the most distant idea that the person “silver'd o'er with age,” to whom we alluded, viz. Mr. John Cavill, of Brighton, was numbered with the dead. We are sorry to inform our readers that the event took place in April last. He was a great lover of mathematical learning—but it is unnecessary to say more at present, as some of our friends have promised to send us Memoirs of this self-taught mathematician, which shall be laid before the public as soon as possible.

We have given ourselves some trouble in collecting materials for a life of the late Mr. George Sanderson, a tailor by trade; but one of the first mathematicians in England. Hitherto we have failed in ascertaining the place of his birth, and shall consider ourselves much obliged to any person who can give us that information, and the particulars of the early part of his life.

and us his and; if it be otherwise, we shall not regret the near his succession.

A Review of Professor Bonnycastle's Treatise on Algebra, Practice and Theory, in No. 2, Vol. II. if possible.

Clarissa, of Beverley, will excuse us giving our opinion on the specimen he mentions; though we see no harm in displays of the kind. He must know that greatness is only a relative term; so that different men value themselves on their different acquirements: one boasts of his strength, another of his riches; one glories in his wit, another in his learning.—Nay, in the lower circles, one vaunts himself on his drinking, smoking, whistling, or even grinning; as “Tom Collins was set down as the most ingenious man in the world, for Tom was able to take off all mankind; and imitate, beside a sow and pug to perfection.”—See Goldsmith's Cit. of the Worl

Mr. H. will find a translation of the epitaph he has sent in the *British Palladium*. The inscription is under consideration.

With all new problems answers must be seen: nothing will be inserted which we cannot answer ourselves; but we frequently want leisure, (especially when making up that department of our work) to enter minutely into the merits of every problem.

Errator's tribute of respect we never received; nor did we kno

THE
QUARTERLY VISITOR.

"Delectando pauperique mouendo,"

MISSION

No. II.

DECEMBER, 1814.

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By P. KELLY, LL. D.

*Author of various Works on Commercial and Mathematical Subjects,
and Master of the Finsbury-Square Academy, London.*

This Work is liberally patronized by the Bank of England, East India Company, the Board of Trade, and by many of the Merchantile Houses. It is chiefly founded on the celebrated German Publication of KÆSE, entitled The Hamburg Comptist, which here materialized, adapted to the English standard, and considerably enlarged, especially in what relates to the British Islands, France, Spain, and Portugal, to Brazil, and Sweden, to the East and West Indies, and to America.

Among the numerous and important additions introduced, New Tables of the Coins of all Nations from Africa, recently as both at the London and Paris Mints; being a Revision of ISAAC NEWTON's Tables, and a continuation of his Plan, by which the intrinsic Value of Exchange is determined.

The Impressions of the Coins are likewise described, and their descriptions, for the first time, rendered into English; the Standard Exchange is simplified and illustrated from recent specie; and the Work concludes with a copious Index and Commercial Dictionary.

Published by LACKINGTON, ALLEN, & CO., LONDON. — 8

ACKNOWLEDGMENTS, &c.

Mr. Youle's reply to the Monthly Reviewers' remarks on his Arithmetic, shall appear in our next, if we can find room for it.—We are glad to learn, that he is determined to point out a portion of the good things they have done, and the manifold evil things which, apparently, they have intended. In reviewing Mr. Youle's Arithmetic, we gave such an account of it as we believe it deserved; and we have not yet discovered any thing in the M. Reviewers' critique, to cause us, in the least, to alter our opinion. Mr. Youle, as a teacher, has had much experience; and we almost feel confident that he will make it appear that he has read as many good treatises on arithmetic as even the M. Reviewers have done.

We regret that the Rev. T. P. Irvin's letter, containing answers to the Queries in No. VI. vol. I. did not reach us in time to appear in their proper place: however, as he was particularly solicitous that his answer to the 35th should appear, we deviate from our general plan, and give it a place upon the wrapper.

As lime-stone, marble, &c. are found, in immense quantities, in almost every part of the globe, containing 44. 5 per cent. of carbonic acid, and as common clay also contains a considerable portion of this acid fluid, whether taken from the surface of the earth, or from the greatest depths, we must naturally suppose that this acid gas has been formed and united with these calcareous substances, at the time when the earth itself was created; as so large a quantity could not possibly be drawn from the atmosphere, in its present state. If we allow, as I think we must, that the quantity afforded by combustion, fermentation, &c. is not more than the vegetable kingdom requires, and actually absorbs; the most natural way of accounting for the existence of so much carbonic acid as we find, is to suppose, with Mr. Kirwan, that almost *as soon as* the elementary particles of which the earth is composed were brought into contact with each other, a superfluous configuration would ensue. All inflammable bodies capable of uniting with oxygen, at the degree of heat produced, would, in course, become saturated with it; calcium would soon form this combination, producing lime; carbon, by its combustion, produce the whole quantity of carbonic acid which we now find; water would, perhaps, be stripped before either of these combinations: when the mass was in a moist state, and *long enough*, the lime would very rapidly absorb the carbonic acid.

the life of that great man, Dr. Moulton, induced us to send the 2nd Prob. to see how the results agreed with our own. Ex. 2, we perceive the conclusion in discordant: Mac and Honeycastle make the required longitude $63^{\circ} 17' 40''$, 67 $^{\circ} 51' 35\frac{1}{2}''$ and Davies $67^{\circ} 50' 15''$. We will examine process; we wish for accuracy in questions of this kind, as they of the utmost national importance: some of recent have been

A. Salp Chandler is informed, it is our opinion that he would be under any apprehension on account of his long stay at sea: we know of no method of ascertaining the latitude longitude, but by the assistance of books and instruments, formed in the life of Dr. Moulton, will fully convince him, no other certain method of finding the longitude, as we have been informed, than that by *Latitude Observations*.

The line HB, in the figure to the answer to the 2nd Prob., is to be considered as parallel to the horizon.

The first aspect of *Euclid* was intended to be completed. She is at liberty to publish those parts which may not her publisher

Erratos shall be excused to. The *Essay on Music* is ours in

A want of room prevented the appearance of Mr. White's method of drawing the Parabola, vide his answer to the 2nd Prob.

A Subscriber's poem on *Let and Learn*, came too late

THE
QUARTERLY VISITOR.

"Dilectorisq; paciterque moneudo."

Horace.

No. III.

MARCH, 1815.

Vol. II.

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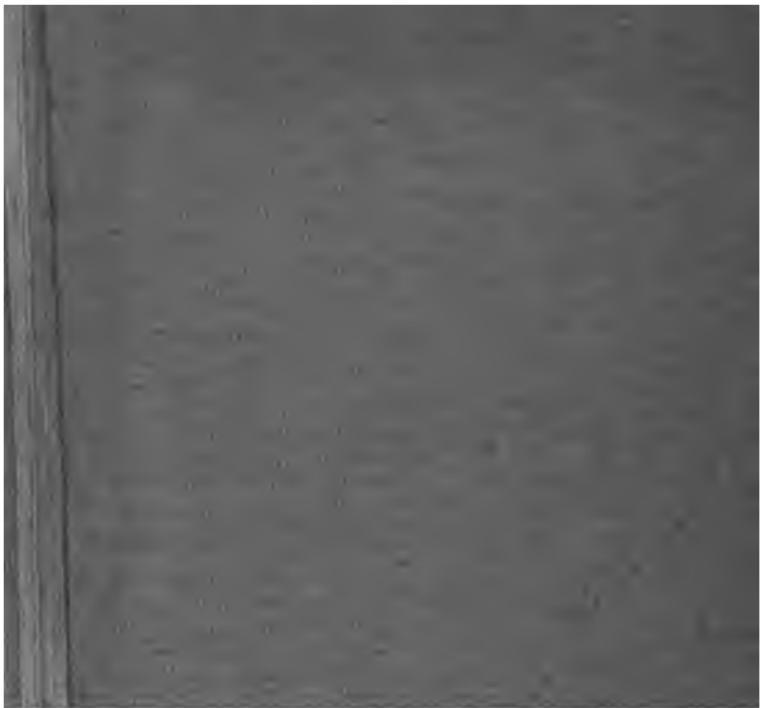
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ACKNOWLEDGMENTS, &c.

To all friends of science and truth, we recommend an attentive perusal of the letter, (the leading article in the present number,) which Mr. Youle, of Sheffield, has addressed to the M. Reviewers. We are constrained to express our regret at seeing that respectable publication sometimes made the vehicle of private interest, or envy.

The *Rule of Five*, which the M. Reviewers say is *founded on error*, and, in many cases, gives *erroneous conclusions*, may be seen in the following works: Sir *Jones Moore's* New System of Mathematics, vol. 1. pa. 30; *Worl's Mathematician's Guide*, pa. 98, ed. 5; *Gordon's Arithmetic*, pa. 115; *Birke's Arithmetic*, pa. 275, ed. 2; *Fyse's Arithmetic*, pa. 77, ed. 6; *Keib's Arithmetic*, pa. 56, ed. 5; and several minor authors. We shall be exceedingly glad to see the M. Reviewers' proof of their assertion. It appears to us rather singular that a rule, *founded on error*, should not *always* give *erroneous conclusions*. We were taught, in our youth, that *if we should adopt a false hypothesis, and argue from it as truth, and should carry on our reasoning over so correctly, yet the conclusion would certainly be false*—because, *from false principles, nothing but falsehood can follow*.—It is our opinion that Mr. Youle has achieved what he intended; and in this we are borne out by the testimony of the *Selecting Reviewers*: “The author, (Mr. Youle) is precise and correct in his definitions, accurate, so far as we have had an opportunity of examining, in the working of his examples, perspicuous in his directions, and often happy in his notes and illustrations. The demonstrations he has given, are in the main neat and satisfactory, and the supplementary treatise on *Magic Squares* and circles, will doubtless both excite and gratify the curiosity of youth in the foremost Arithmetical classes. The gentleman's work indicates skill, judgment, and care; and we have no doubt that it will be advantageously introduced into many schools.”

familiar as the nature of the subject will allow. The *Quarterly Reviewer*, at the end of each book, render the publication especially valuable; and we cannot even let slip this opportunity to recommend it to the notice of every scientific editor.

That our readers will like to read how *Abenaki* effected his cure, cannot be doubted.

Reviewers' further communications will be respectfully noticed, as will *Editorials*.

Mr. Page's new problem in our next.

We shall attend to what Mr. Youle says respecting the *Reviewers*; but it is conjectured, if they can, like *Admiral Belcher*, "make the worse appear the better reason," he will hear from them.

A New Subscriber's communication shall appear in No. IV.

If A. B. Hall, will peruse pages 292, &c. of "*The Literary and Scientific Panorama*" (sold by the Printer of this Work), will see two proofs of Mr. Emerson's assertion; which, we believe, render all further discussion on the subject unnecessary.

THE
QUARTERLY VISITOR.

"Dele credendo pariterque credendo."

Horace.

No. IV.

JUNE, 1815.

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AT SPURN POINT,
ON THE HOLDerness COAST.

BY WILLIAM THOMPSON,
Master of a Seminary for a limited number of Pupils
At HEDON, YORKSHIRE.

" — *Heit than seen*
" *Overwhelming tempests down thy Bark ;*
" *A shipwreck'd sufferer hast thou been,*
" *Misfortune's mark ?* *MUSGRAVE*
" *Quis Indio fando,*
" *Temperet a lacrymis ?* *VERGIL.*

HULL.

LATELY WAS PUBLISHED,
AN ELEMENTARY INVESTIGATION
UPON THE
Theory of Numbers,
WITH ITS APPLICATION
TO THE
Indeterminate & Diophantine Analysis,
THE ANALYTICAL AND GEOMETRICAL
DIVISION OF THE CIRCLE,
AND SEVERAL OTHER
CURIOS ALGEBRAICAL & ARITHMETICAL
Problems.

By PETER BARLOW,
Of the ROYAL MILITARY ACADEMY,

LONDON: Printed for J. Johnson and Co.
St. Paul's Church-Yard.

Whoever is profoundly read in Mathematical subjects, must be convinced that works of real merit seldom make their appearance. However, our readers may rest assured that the above is a publication of that stamp. The *Indeterminate* and *Diophantine Analysis* is largely insisted on, and executed in a masterly manner. In this book there is no display of the modern art of book-making: no unnecessary use of words, no wandering from the subject;—it is made clear, and may be comprehended by all those who will give themselves the trouble to read the production attentively.

ACKNOWLEDGMENTS, &c.

Tyro is informed that it is our opinion there is no short method of acquiring a perfect knowledge of the Mathematics; and whatever some people may have said to the contrary, we presume, he will find our thoughts are correct on that subject. We deem the same labour necessary to make a Mathematician as Sir Joshua Reynolds asserts should be used to make a good painter—“those who are determined to excel *must go to their work whether willing or unwilling, morning, noon, and night, and will find it to be no play, but very hard labour.* They must, therefore, be told again and again, that *labour is the only price of solid fame*, and that whatever their fire of genius may be, there is no easy method of becoming a good painter. If you have great talents, industry will improve them, if you have but moderate abilities, industry will supply their deficiency. Nothing is denied to well directed labour; nothing so be obtained without it.” We do not profess to know which are the most useful branches of the Mathematics. Every thing is of use when it is wanted; and where is the man that has the attorney to say to another, such a part of human learning will be useless to you?

Jack, of Sunderland, needs not fear that we will “crowd canyons,” or “knur off.” Our cause is a good one, and we will not show our stern to our opponent, unless we take him in *lum*. Jack, if we mistake not, was one of our quondam *associates*, and when he brings up at this port, we shall be glad to have him. His Letter-Observation Problem is our next.

A New Subscriber's communication is unavoidably postponed; but it shall appear in No. V.

We are sorry that Mr. Page's letter is mislaid; he will, therefore, be pleased to send us another copy of his problem.

“No. 5, Vol. II, will be published on the first of September.—All Communications intended for insertion in that Number, must arrive on or before the 15th of July, (post-paid,) addressed to Mr. W. Pascoe, No. 21, Bondstreet, Holb., or for him, to the care of Mr. Romney Park, Reigate, Surrey.

THE
QUARTERLY VISITOR.

"Delectando pariterque inveniendo."

Horace.

No. V.

SEPTEMBER, 1815.

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PRICE ONE SHILLING.

Had it been in our power, we should have been happy to have complied with the request of A. B. in furnishing the public with a Memoir of the late Mr. Nicholson; but to spare our inclination to oblige our friends, we have copied the following from the New Monthly Magazine:—

"Mr. WILLIAM NICHOLSON was born in 1735, in London, where his father practised the law, as a solicitor in the Inner Temple. The son received his education at a school in the north of Yorkshire; but at the age of sixteen he entered into the East India service, in which he made two voyages before the year 1773. He was afterwards employed in the country trade in India, but in 1776 he was engaged on the continent as a commercial agent to the late Mr. Wedgwood. Soon after this he settled in London and became a teacher of mathematics; to which profession he added that of an author, translating from the French with great facility, and publishing, besides, many useful compilations of his own, chiefly on historical and scientific subjects. In 1781, he printed an "Introduction to Natural Philosophy," in two volumes octavo, which work was so well received as to supersede Rowney's System of Natural Philosophy, which had long been an elementary book for students. The year following, Mr. Nicholson published a new edition of "Ralph's Survey of the Public Buildings of London and Westminster," with additions. This work was succeeded in 1783 by a translation from the French of the "History of Hyder Ali Khan, Nabob Bahader, or Memoirs concerning the East Indies;" with historical notes, in two volumes, octavo. In 1784, and

ACKNOWLEDGMENTS, &c.

not much to be wondered that this Assistant was neglected, while the easy treatise of Moore, which gives the conclusions without reason, and lays no tax upon the judgment or the memory, still continued to hold its ground. In 1786, we find Mr. Nicholson publishing "An Abstract of the Acts relating to the Exportation of Wool;" to which subject he was led by his acquaintance with the clothiers. The next year he printed a "Review of the Controversy between Kirwan and the French Academician, on the subject of Phlogiston;" and in the Philosophical Transactions for the same year, is a paper of his containing "The Principles and Illustration of a Method of arranging the differences of Logarithms, on Lines graduated for the purpose of Compensation." In the following volumes of the same Transactions, are two papers of Mr. Nicholson's, one "The Description of an Instrument which produces the two states of Electricity without friction, or communication with the Earth;" the other, "Experiments and Observations on Electricity." In 1779, appeared his translation of "Fourcroy's Elements of Natural History and Chemistry," in four volumes, octavo; in which, the year following, he added a supplemental volume "On the first Principles of Chemistry." In 1790, Mr. Nicholson translated, from the original manuscript, "Memoirs and Travels of the Count de Bonyowski," two volumes, quarto. The next year came out the translation of "Chaptal's Elements of Chemistry," in three volumes, octavo. In 1792, an agreement was entered into between Mr. Nicholson, then living in Red Lion-square, and Captain William Locker, of the royal navy, the patron of Nelson, by which the latter gentleman engaged to put all his naval manuscripts into the hands of the former, for arrangement, selection, and publication; but the design, on some account or other, was relinquished; though that valuable collection afterwards proved the basis of Mr. Charnock's "Biographia Navalis." In 1793 appeared "The Dictionary of Chemistry," in two quarto volumes, and two years afterwards, the edition of his "Journal of Natural Philosophy, Chemistry and the Arts;" which was printed originally in the quarto-form, but was afterwards enlarged to the more portable one of an octavo. About the year 1799, he opened an establishment in Soho-square, for twenty pupils, which institution he carried on several years; but it at last declined, chiefly owing, as we believe, to the attention paid by Mr. Nicholson to other objects; particularly to the West Middlesex Water-Works, the plan of which originated with him, as also did that for the supply of Portsmouth and Gosport. He was also engaged in a similar undertaking for the borough of Southwark, and besides these different enterprises, he took out patents for some mechanical inventions. In 1803, he printed a work translated from the Spanish, "On the Bleaching of Cotton Goods, by oxygenated water, &c." and in 1803 appeared "A general System of Chemical Knowledge."

little, if any, share in the compilation; and that both, though so well executed by the same hand. Mr. Nicholson was at this time difficulties, and on that account the bending of his name was deemed to be necessary; but the case was very different on the other — as the reverend cleric had not long before been presented to very valuable crown living, as a reward for writing some pamphlet in favour of the ministry. In 1810, Mr. Nicholson had no disputes relative to the work in which he was employed, engineer to the Portsea Island Water Work Company, on which he published "A Letter to the Proprietors of the Poole Water Works, occasioned by an application made to them by the Author under an act for bringing Water from Fordington." This ingenious and indefatigable man shared the common fate of injustice, to be continually employed without enjoying any material advantage from his labours. Though incessantly occupied in his concerns, and urgent in promoting the interests of science, was generally embroiled in his circumstances; and, notwithstanding his untumultuous industry, he lived in trouble, and died poor.

The communications of *Mrs. Haines*, *Pareau*, *Greaves*, *Waterhouse*, shall have a place, if possible, in our next. *Jonathas*, *Manchester*, and *Jack*, of *Sunderland*, shall also be attended to.

We shall be happy to receive the *Memoirs* mentioned by *J. Haines*, and *Mr. Hovey*; and request they will let us have all contributions as early as possible.

THE
QUARTERLY VISITOR.

"Delectando parit ergo monendo,"

Horace.

No. VI.

DECEMBER, 1815.

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NOTICE.

Several Sets of the "LITERARY and SCIENTIFIC PANORAMA," published by Mr. J. Simpson, having fallen into the hands of the Printer of the "QUARTERLY VISITOR," any person desirous of obtaining either the first or common edition, or any single Number of that work, may be supplied on application at the Printing-Office, 56, Scale-Lane.

No complete copies of the Quarterly Visitor remain on hand; the early Numbers being entirely out of print.—Should a sufficient demand for copies of the work be found, these Numbers will be reprinted.—Application must be made to Mr. Turner, the Publisher, Market-Place.

* * * *The Subscribers are recommended to have the Wrappers bound up at the end of the Volume.*

Hull, 30th November, 1815.

ACKNOWLEDGMENT.

We regret that the life of Mr. Henry Clarke did not arrive sooner, as we are not enabled to give it a proper place.

HENRY CLARKE, an ingenious Mathematician, was born at Salford, Manchester, in 1782; and served an apprenticeship to the business of a tailor: but being a proficient in the mathematics, and an admirer of fine writing, he opened a school in his native village, and taught there, for several years, with reputation. At the conclusion of the American war, upon a disappointment he met with in his family, he went over to New York, where he established a school; but left it, though in a flourishing state, for a more advantageous settlement at Baltimore, where he died in 1799. He had two brothers, tailors and mathematicians, who are now likewise dead.

His works, most of which are scarce from the small number printed, are as follow:—

Practical Perspective, with 33 plates, volume I. two. The Rationale of Circulating Numbers, &c. &c. A Synopsis of a Course of Lectures on Geography, Astronomy, and Navigation, with Schemata, from which B. Downe took the hint of his Planetarium. A Dissertation on the Summation of the Infinite Converging Series, with Algebraic Divisors, from the Latin of Loggia, &c.

This last publication involved Mr. Clarke in a controversy with Mr. John Landen, the celebrated Mathematician.—Mr. Clarke in the preface, remarked, "though it must be acknowledged that our countryman, the late Mr. Simpson, has carried the subject much farther, in his Mathematical Dissertations, than any other writer before him; yet whoever compares the method pursued in the treatise with his, cannot long hesitate in giving our author

deceased friend, Mr. Thomas Simpson, wherewith is pointed out a very ready method of computing the sums of a great number of such series, comprehending, at least, all that can be done by the method exhibited with so much extenſion in the Translation of Mr. Lorgna's book,

Mr. Landen proceeds to show that Mr. S.'s method is neither less general, nor less elegant than the *lewd method* of Mr. Lorgna. Mr. Landen concludes thus: having made these observations, I cannot but think, that the commentator would have shown not less judgment, if instead of applauding so extravagantly the faulty work which he undertook to explain, he had corrected the errors in it, and supplied its defects. A work, wherof more than thirty pages are filled with embarrassed investigations of ill-expressed, particular formulae; without exhibiting any general theoremo, like our *Supposition* one at page 34, though boasts of permanency, and indeed of every excellence, are not warning—“Surely Mr. C. has made this country a very poor compliment, in supposing, that such a work, with his frivolous and tedious notes theron, could be acceptable to the *British Mathematicians*!”

Mr. Clarke published a Supplement to Professor Lorgna's Summation of Series, in which he defended himself against the attack of Mr. Landen; and adds—“Now gentle reader, for your further acquaintance with *men, manners and things*, I shall present you (by way of conclusion) with a translation of a few pages from the *Acta Eruditorum* of Leipzig, for September, 1762 (p. 339); and when you have well digested, and strictly compared it with that Gentleman's second *Memor*, (p. 23, &c.) particularly the ninth and tenth articles thereof, I would advise you to annihilate

